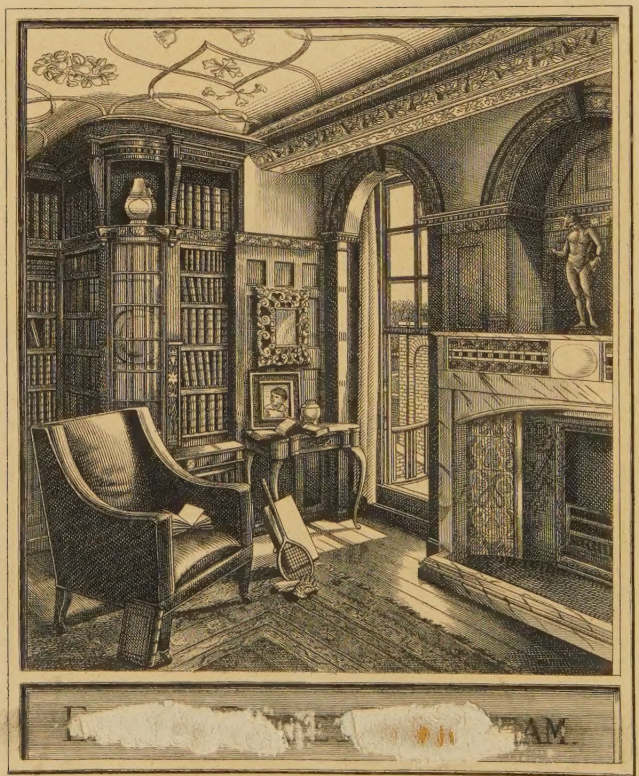
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THE PHILOSOPHY OF BERGSON

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THE PHILOSOPHY OF BERGSON

BY

A. D. LINDSAY

FELLOW AND TUTOR OF BALLIOL COLLEGE, OXFORD

1911

J. M. DENT & SONS, LTD.

BEDFORD STREET, STRAND, W.C.

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Printed by Ballantyne, Hanson & Co.
At the Ballantyne Press, Edinburgh

PREFACE

Some apology is needed for publishing a book on the philosophy of Bergson. Books on philosophers are always a poor substitute for the writings of the philosophers themselves, and that is especially true of a writer so brilliant as Monsieur Bergson. My excuse is that in some degree the very brilliance and charm of Monsieur Bergson's writing has hindered a proper appreciation of his work. His method of philosophical exposition is a combination of abstract thinking and most illuminating and suggestive concrete illustrations. The combination constitutes, I think, an ideal method, but, as few professional philosophers since Plato have had the artist's power of concrete vision, an unusual one. In consequence the suggestiveness of the illustrations has obscured the systematic nature of the thought which they illustrate, and Bergson has, in spite of his explanations and protests, too often been regarded by his

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admirers as a philosopher who does not believe in systematic thinking and by his critics as a writer remarkable indeed for some brilliant *aperçus* but not to be taken seriously as a philosopher. I have therefore endeavoured to bring out the unity and systematic nature of Monsieur Bergson's thought, and to show something of its connection with the historical development of philosophy, and more especially with the philosophy of Kant. The book does not pretend to be an account of all Monsieur Bergson's work. There are many things in his writings which I have not discussed, notably his contribution to æsthetics in *Le Rire* and his more special psychological studies, such as *Le Rêve*, *L'Effort Intellectuel*, and *Le Souvenir du Présent et la Fausse Reconnaissance*. Further, as I have wished to examine certain problems with which modern philosophy is especially concerned in the light which Monsieur Bergson throws upon them, rather than to make a critical study of his writings in great detail, I have not been careful to distinguish when I am merely giving a résumé of what Monsieur Bergson says and when the arguments are my own.

For the same reason I have ventured to criticise the details of Monsieur Bergson's arguments when they seemed to me to obscure what I take to be the main results of his thinking.

As a justification of my attempt to reduce to more technical terms and to connect with previous philosophy, writing so fresh and original I would quote Monsieur Bergson's own words:—

"La philosophie, dans ses plus profondes analyses et dans ses plus hautes synthèses, est obligée de parler la langue de tout le monde. De là une illusion assez répandue, qui consiste à croire qu'on peut aborder d'emblée l'œuvre d'un philosophe contemporain, y entrer de plain pied et la réfuter au pied levé, trancher les problèmes qu'elle pose ou les écarter comme autant de futilités, sans tenir compte des vingt cinq siècles de méditation, d'inquiétude et d'effort qui sont comme condensés dans la forme actuelle de ces problèmes et jusque dans les termes dont nous nous servons pour les énoncer."[1]

For convenience I have cited the pages in the English translation of *Les Données Immédiates de la*

[1] *Revue de Métaphysique et de Morale*, vol. xvi. p. 32.

Conscience, *Matière et Mémoire*, and *L'Evolution Créatrice*, and have referred to these books by their English titles and in most cases quoted from the translation. As the *Introduction à la Métaphysique* which appeared in the *Revue de Métaphysique et de Morale*, January 1903, is now out of print and almost inaccessible in French, I have in referring to it cited the pages of the German translation.

The book contains the substance of lectures which I delivered at Balliol as Jowett Lecturer, and I have not been careful to remove all traces of their original form, nor to change their original character, of an endeavour rather to help myself and possibly others to understand the main lines of Monsieur Bergson's thought than to appraise its value or to attempt a complete and critical answer to the questions which it raises.

A. D. LINDSAY

April 1911

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THE PHILOSOPHY OF BERGSON

CHAPTER I

INTRODUCTION

In a passage of the *Critique of Pure Reason* Kant remarks that "It is a great and essential proof of cleverness or insight to know how to ask reasonable questions." Many difficulties and antinomies in philosophy arise, he held, from a failure to ask the right question, or from asking questions which have really no meaning. In face of antinomies thus created, the chief part of the philosopher's task is his statement of the problem, and he may be judged to have succeeded if in his new statement he brings together the elements of importance in the old problems. Yet this is bound at first to have the result that the new philosophy will be hard to classify: it will not fit into any of the old schools; it may seem to be a mere confused jumble of inconsistent doctrines, a comprehensive

eclecticism; and if we go to it with the old questions, we may get what seem unsatisfactory or inconsistent answers. The new philosophy will win its way only if through its help the antinomies of the older are exposed and resolved.

Kant's own philosophy made an advance of this kind. He began, as we know from his correspondence, with a consciousness of antinomies. He was convinced of the truth of certain elements both in English Empiricism and Continental Rationalism, as he was convinced of the unsatisfactoriness of either of these doctrines taken by itself. The Critical Philosophy began when, from a study of these antinomies, he came to formulate a new problem. A great part of the advance in philosophy made by the *Critique* consisted in the perception of the problem involved in synthetic *a priori* judgments; and while there are differences of opinion as to the success with which Kant solved the problem which he stated, almost every one is agreed that its mere statement marked an epoch in philosophy.

Now, without suggesting any comparison in importance between Bergson and Kant, there is this resemblance between them, that much of the interest of Bergson's work consists in his statement and

exposition of antinomies to be found in present-day philosophy, that as the best road to the solution of these antinomies he offers a new statement of the task or problem of philosophy, and propounds a new method. Like Kant's, his work professes to be critical: to find the main source of previous difficulties in an uncriticised assumption. This new statement of problems has the natural result that he will fit in to none of the ordinary categories of philosophical schools. He has been called a Pragmatist; and much of his work consists in insisting on the influence of practical considerations on thought, both ordinary and scientific, and in detecting that influence just where its presence had been least suspected. Yet at the same time he believes in the power of thought to transcend this influence, and insists that philosophy is only possible if the distinction between thought and action, which Pragmatism tends to deny, is clearly recognised. Much of his work in *Matter and Memory* is devoted to showing mind's independence of body: he pushes to great lengths the notion that mind is more intelligible than matter, that the truest and most metaphysical apprehension of reality must be in forms of mind. Yet he is not an idealist in the ordinary sense. No one has

stated more trenchantly the externality of perception. He brings together in *Matter and Memory* arguments with which we are familiar in modern Realism. But his realism is such as to allow, and indeed perhaps sometimes unduly to insist upon, the subjectivity of much of our thinking. Much of his work is psychological. The first chapter of *Time and Free Will* is an inquiry as to how we come to attribute intensity to our psychical states—a purely psychological inquiry. *Matter and Memory* is largely concerned with the results of specific researches into the relations of brain and mind; and Bergson believes that these results may be of real importance in a philosophical account of the relations of mind and body; not as providing a theory, but as proving that the philosophical theory will explain the detailed facts. Yet, at the same time, his work, especially in *Time and Free Will* and in the essay on Psycho-physiological Parallelism, is a criticism of the foundation and assumptions of most psychology, a criticism which leads to the view that psychology is only possible when it follows the reflective method of philosophy.

Bergson, then, is not easy to classify. If we were, in the manner of some writers, to ask

what propositions he holds to be true, we might produce a list showing that Bergson agrees in some proposition with the most various and strictly opposed philosophers. Yet he is not to be styled an Eclectic. For he claims at least that all these propositions, hitherto supposed to be incompatible, will be seen to involve one another in the light of his new statement of the problem of philosophy. It is not because he is sometimes an Idealist, and sometimes a Realist that he agrees with some of the statements of the first school and with some of the second. He does not sometimes think that presentations are inside consciousness, and sometimes that they are outside; rather he has shown that the question whether objects are inside or outside the mind (which has divided Idealism and Realism) is really unmeaning, and has suggested that the problem of the relation between mind and its objects should be stated in terms not of space but of time.

Bergson thus resembles Kant in this, that his work springs from a consideration of antinomies and a conviction that they can be resolved only by approaching problems by a new method or from a new point of view. Whatever, therefore, we may think of his success in providing a solu-

tion, a study of his work cannot fail to be instructive in so far as it will be a study of tendencies in modern philosophy. For that reason I propose to devote attention to Bergson's exposition of antinomies, to his critical rather than to his constructive and positive work. There can, I think, be little doubt as to the great value of the first. The value of the second is much more difficult to appraise.

But there is another and more interesting aspect in which Bergson resembles Kant, and can at the same time be contrasted with him, viz. in respect to his view of the relations between philosophy and science. Kant's whole work is dominated by his conception of science. The *Critique* begins with a contrast between the assured and certain results of science and the uncertainty and confusion of existing metaphysic. The *Critique* is both a criticism of metaphysics and a validation of science. It establishes or seeks to establish the conditions on which the success of science depends. His analysis of the *Critique* is entitled *Prolegomena to any future metaphysic which can pretend to be scientific;* and he got his notion of what "being scientific" involved from his knowledge of the most progressive sciences of his time, mathematics

and mathematical physics. His philosophy presupposed though it criticised science. He was himself both scientist and philosopher.

Since Kant's time the enormous growth of the sciences and the increasing specialisation of all intellectual work has caused a divorce between philosophy and science. It has been increasingly hard for the philosopher to take anything like a synoptic view of the results and methods of scientific inquiry. Philosophy has less and less held it to be its concern to survey reality as presented in the sciences, and, from a more comprehensive view than that of any one of them, display the whole of which they are parts. Sometimes it has essayed to comprehend reality independently of the detailed results of the sciences, contenting itself with knowing that science, because abstract, must be wrong, and not always realising that a proud independence of matter of fact may be as abstract. This produces an irritating encounter with the scientist who has found that his science raises philosophical problems. The scientist knows that philosophy cannot do his work over again without his patient study of detail, and fails to see how the philosopher can criticise his results unless he to some extent studies and accepts them. Perhaps more often philosophy tries to

become scientific by limiting itself, finding some special region of facts which only philosophy can explore, in the hope, expressed or implicit, that a conquest of that region may bring with it a mastery of all the field of knowledge. This explains the excessive preoccupation of philosophy with theory of knowledge—an inquiry which, when it is treated in entire isolation from what is known, is bound to be barren and apt to become subjective. It accounts for the impossible view often taken of psychology, that it is a special inquiry to be studied scientifically, which is to have all the rigour and certainty of the most rigid science, and yet is to contain within itself the explanation of many, if not all, the problems with which the other special sciences deal.

But philosophy can neither be an isolated science nor isolated from all science. It cannot be its business to do over again the work of the sciences, to check and correct their investigations, yet it cannot exist apart from science. If it does not study any particular facts, it at least studies scientific investigation, and reflects upon the results and methods of science.

In spite of any formal separation between science and philosophy there is no doubt that philosophy

is affected by progress in science, that the different problems with which philosophy is concerned from time to time are largely suggested by the different stages of scientific inquiry or the different natures of the sciences which are for the time the most important. It is a commonplace that not only was the development of modern philosophy, which began with Descartes and culminated with Kant, coincident with the development of modern mathematics and the enormous progress made by such sciences as physics and mathematical astronomy, but its methods and aims were largely influenced by the methods and aims of the mathematical sciences. It is as universally recognised that many of the most important of present-day problems in philosophy are raised by the remarkable growth of the biological sciences since Kant's time. These are problems found within the sciences; they concern the whole question of the applicability of the mathematical method to the facts of life. The difficulties of the biological sciences have therefore raised what is eminently a philosophical problem, the solution of which will be at least assisted by, if it does not necessitate a knowledge of, the detailed form in which the problem presents itself in the sciences themselves.

Kant, when he spoke of science, meant mathematical science. He even goes so far as to say that an inquiry is scientific just in so far as it is mathematical. The main heads of his *Prolegomena to any future metaphysic which may pretend to be scientific* were, therefore, naturally: "How is pure mathematics possible? How is pure science of nature (by which he meant physics) possible? and how is pure metaphysic possible?" He answered the first two questions in terms which precluded the possibility of metaphysics. The growth of the biological sciences suggests the further question, or perhaps questions, How is biology possible? and how is psychology possible? and raises the possibility that these questions may be so answered as to suggest how metaphysics is possible. Bergson, in bringing philosophy back into close contact with science, is continuing the questions of the *Prolegomena* in this sense. He has himself stated this very clearly:[1] "This method claims to escape from the objections which Kant has formulated against metaphysic in general, and its principal object is to remove the opposition established by Kant between metaphysic and science, by taking account of the

[1] Discussion on "Le parallelisme psychophysique et la metaphysique positive," *Bulletin de la Société Française de Philosophie*, June 1901.

quite new conditions in which science works. If you read the *Critique of Pure Reason* you see that Kant has criticised, not reason in general, but a reason fashioned to the habits and exigencies of the Cartesian mechanism or the Newtonian physic. . . . The doctrine that I defend proposes to rebuild the bridge (broken down since Kant) between metaphysics and science. This divorce between science and metaphysics is the great evil from which our philosophy suffers. We are fond of saying that the faults are on the side of the scientists. Let us ask ourselves if we have not, too, some reason to reproach ourselves. Let us ask whether our metaphysic cannot be reconciled with science simply because it lags behind science, being the metaphysic of a rigid science with entirely mathematical categories, in short of the science that flourished from Descartes to Kant, while the science of the nineteenth century seems to have aspired to a much more subtle form, and not always to have taken mathematics as its model."

We may regard Bergson as completing rather than opposing Kant's work, inasmuch as his criticism of the attempt to make all science mathematical or to construct a universal mathematic is, like Kant's criticism, a delimitation of the sphere of mathe-

matics rather than a denial of their validity within their own sphere. Hence, as Kant claims, such criticism is equally removed from dogmatism and scepticism: from the dogmatic determinism which asserts the theoretical possibility of expressing all reality in terms of mathematical necessity, and the scepticism, expressed *e.g.* in Mr. H. G. Wells's *Scepticism of the Instrument*, which sees in the failure of mathematics to apply to all the details of reality a proof that mathematical laws may themselves be false.

We take it, then, that Bergson's work is primarily an attempt to examine the assumptions of the biological and non-mathematical sciences, and to discover whether there are not certain inquiries which are not mathematical but which nevertheless give us knowledge, and in the light of such inquiries to renew the question of the *Prolegomena*, How is metaphysic possible?

It may be useful to notice how far Bergson is here giving more special attention to a problem already raised though not satisfactorily solved by Kant. Kant denied the possibility of metaphysics, because metaphysics could not fulfil the conditions of the mathematical sciences. Yet while the mathematical sciences are, in Kant's eyes, the only strict

sciences, he recognised the existence of certain inquiries which were not capable of an *a priori* treatment, and in the third *Critique* he examines not the *a priori* constitutive principles, but the postulates of empirical inquiry. In the *Critique of Teleological Judgement* he definitely asserts the limitations of the mathematical or mechanical method, and sets by its side the teleological; and in that *Critique* he is largely concerned with the problems already raised in biology, and he considers that this *Critique* mediates between the first and the second, *i.e.* between the principles of the mathematical sciences and the metaphysical concepts which are implied in conduct.

Kant considered himself to have established the validity of the mathematical sciences by showing that they are confined to phenomena and do not apply to things in themselves. This distinction is open to the interpretation, which has perhaps usually been put upon it, that the *a priori* sciences are possible because in them the mind is in contact with realities or things which are somehow constructed by the mind, and which as actual entities must be distinguished from the things in themselves which exist unknowable behind them. This interpretation has naturally led to a doctrine of the relativity of

knowledge, against which we shall find Bergson protesting, and even, in spite of Kant's repeated protests, to the view that the mind has somehow superior knowledge of its own states. Under such an interpretation the validity of the mathematical sciences which the *Critique* establishes is not worth much.

But if we examine the actual arguments either in the Deduction or the Schematism of the Categories, we find that Kant is concerned, not with the soundness of mathematical reasoning, but with the validity of its application to reality as presented in perception; that that depends on the principle that mathematics involves synthesis of the homogeneous; and that in mathematical synthesis we are synthesizing discrete elements whose discreteness is the work of the understanding. This is seen more especially in the part played by time in the Schematism of the Categories. Time is regarded by Kant as a homogeneous order, the relations of whose parts can be anticipated just because time is homogeneous, and the principles involved in such a homogeneous order can be applied to reality in so far as real things appear in time. When Kant comes to treat of causation, he finds the difficulty that causation is synthesis of the heterogeneous and

hence cannot be anticipated. His solution is that there can be an *a priori* principle of causation only in so far as things can be regarded as points in the time series. Causation is the relation, in a continuous change, between one point taken by us and another point also taken by us. We have made the discretion, and hence the synthesis is of a series the points in which are of our distinguishing.

Hence, when Kant says that the principles of the mathematical sciences are valid only of phenomena, that means at least that they are valid of reality in its spatial and temporal relations, space and time being regarded as wholes which we articulate. We can have an *a priori* law of causation because causation is a time relation. But particular laws of causation are not derivable from the general nature of time, but from a study of real events that occur in time. Therefore, as Kant insists in the *Critique of Judgement*, they cannot be anticipated, but must be studied empirically. In that *Critique* he examines the principles governing empirical investigation and distinguishes the two principles of mechanism and teleology, both of which he asserts to be necessary to science without being able to explain their relation. The concept of teleology is necessary in science in so far as we have to recog-

nise in empirical investigation the individuality and distinct nature of different things, but it is a concept with no relation to Kant's *a priori* principles of the understanding. Its importance lies in the implication that while the principles of the understanding are valid only of phenomena, of a synthesis of points which *we* have distinguished, empirical knowledge demands some apprehension of the real articulation and individuality of things, though the method and principles of such apprehension are unexplained.

Kant also applies his distinction of phenomena and thing in itself to the self, and asserts that the self can only be known phenomenally: which means, in so far as it can be regarded as a series of discrete states, acting, as the *Critique of Practical Reason* shows Kant to have thought, externally upon one another according to the principle of causation.

Kant's doctrine that we only know phenomena, and his statement that an inquiry is only scientific in so far as it is mathematical, are thus two ways of saying the same thing: that we can only know objects, whether physical or psychical, in so far as they can be regarded as discrete external points in a time series. Following this principle science has endeavoured to construct a scientific psychology and a scientific biology, whose main assumption is that

their objects can be treated as so discrete: that we can regard the mind as an aggregate or series of states, and animal life as an aggregate or series of mechanical changes.

Bergson's examination of the antinomies created by this assumption results in showing that a scientific psychology and a scientific biology are not possible if scientific is to be taken to mean mathematical. But this result raises the further question, Are such inquiries of no value because they are not mathematical? Do they or should they want to be so? Have they no standards or methods of their own? This leads to a consideration of those elements in knowledge which are not represented in mathematical analysis; and to Bergson's account of intuition. The question, How are psychology and biology possible? is answered thus: Only because knowledge is not exhausted in mathematical analysis, because over against the discursive understanding stands the more immediate intuitive knowledge.

As, then, the examination of the possibility of the mathematical sciences led in Kant to a critique of the understanding, the examination of the possibility of the biological sciences leads in Bergson to a critique of intuition. It is here that we have perhaps the chief interest and difficulty of his work.

Criticism of the discursive understanding is not new, and we are all familiar with views which depreciate the scientific understanding at the expense of something more immediate and profound, something more akin to feeling. Hume's scepticism, for example, is an attack on reason in favour of feeling, and feeling which is thus exalted is something which has no standard and no methods, whose only test is subjective and momentary. The discursive understanding is examined and found wanting, but the feeling or intuition set up in its place is not found wanting simply because it is not examined. It is therefore of great importance that the criticism of the limits of mathematical thinking is in Bergson made in the name of science. For the existence of inquiries such as biology and psychology, and (we would add, though Bergson unfortunately does not do so) as history, may show us that non-mathematical inquiries have their own standards, their good and bad methods, though they may not be accessible to just the same kinds of test and verification as are the mathematical sciences. Thus Bergson himself does not attack the sciences in the name of immediate feeling, though some of his followers may do so. Intuition is for him not a method practised by turning away from the results

of the sciences, but by somehow completing them. His doctrine of intuition is, as we have seen, an attempt to rebuild the bridge between science and metaphysic. He says in the conversation from which we have already quoted: "If by mysticism be meant (as it almost always is nowadays) a reaction against positive science, the doctrine which I defend is in the end only a protest against mysticism." M. Le Roy, his interlocutor, suggests that the true opposition is between intellectual thought and thought lived, to which Bergson replies: "That is still intellectualism, in my opinion. But you are quite right to distinguish between thought drawn from its profound sources and superficial thought, which is ready to fix itself in formulas. Automatism is the enemy. That is true of the intellectual life, as of the physical and moral life." "There are two kinds of intellectualism, the true, which lives its ideas; and a false intellectualism, which immobilises moving ideas into solidified concepts to play with them like counters."[1] We are, then, to have the criticism of an intuition which is distinguished equally from the discursive understanding and from mere feeling.

[1] *Bulletin de le Société Française de Philosophie*, vol. i. p. 64.

We suggested that the answer to the new question, How are the biological sciences possible? might raise afresh the question as to the possibility of metaphysics, answered in the negative by Kant. Here again let us see where Kant left the problem. Metaphysics implies knowledge of the absolute or of things in themselves: but for Kant all knowledge is mathematical knowledge, and as that is only of phenomena, metaphysics is impossible. But, as he said, Kant limited reason to make room for faith, and the metaphysical concepts of God, Freedom, and Immortality, though they could not be known, could be lived. This results in his remarkable account of freedom. On the one hand we have the phenomenal self regarded as a series of external states influencing one another by mechanical laws, in such a way that were these fully known, they could be fully determined beforehand: on the other hand the self as moral agent, a responsible individual standing in relation to other responsible individuals, and whose actions are therefore free. The difficulties in ethics into which this distinction led Kant are well known. Just because the phenomenal self can only be known in so far as it is regarded as a series of discrete states governed by the law of causation, it can only be known as in its

place in the phenomenal world regarded as a similar but larger series. Therefore, if there be any known relation between a particular state of mind and a particular change in the outside world, or *vice versa*, the relation must be that of necessary causation. In other words, as phenomenon the individual loses his individuality. We may make the attempt to separate a psychological series from a physical series (we shall find Bergson examining attempts of this kind), but in the end, once we regard the self as a series of separate discrete states, we can no longer maintain the distinction between that series and other similar causal series. Kant's answer to this difficulty is that causation only holds of the self as phenomenal, and it is more than phenomenal. Treatment of the self as a series of discrete states is then, according to Kant, inadequate. We escape from causation only in so far as we can regard the self as individual, and since we can never *know* anything as individual, freedom can never be known. We get free action only in so far as we realise the self as acting from motives that stand in no relation to other things at all, in moral praise or blame that takes no account of circumstance. It follows that for Kant there can be no degrees of freedom: or at least if there are they cannot be known. For, it is

important to recognise, freedom is a question of individuality, and for Kant in the *Critique of Practical Reason* there is no third alternative to knowing the self as a series of states in causal relations with the rest of reality, a mere nexus of changes, hardly even a nexus, and realising the self as acting under the moral claim to behave as an independent moral agent responsible to other independent moral agents.

Now, the real difficulty as to knowledge of phenomena, according to the interpretation we have suggested, is that the separations and discretions taken in reality are the work of the mind: things are regarded for mathematics as occupying points in a homogeneous space. The number of points between which we may choose in seeking a starting-point in any investigation is infinite: there is no point we *must* take. We know change by taking points in a homogeneous time series. But just because continuous change is not really a series of moments, or the surface of objects in space a series of points, our moments or points on which our applied mathematical inquiries are based have no necessary relation to the real articulation of things. This will be clear if we ask of Kant the question, How many things in themselves are there, or is

there any way of knowing that there is more than one? Now we shall find Bergson insisting on the disparateness between the divisions we may make in reality in the application of mathematical methods and the real articulation of things, and pointing out that just because for mathematics, *i.e.* for the theoretical side, it does not matter what point we select for our axis of co-ordination, the question is really decided by practical considerations; and that it may sometimes be and sometimes not be convenient "to carve reality at the joints." If, then, the mathematical sciences tell us nothing about the individuality of things, and if they comprise all knowledge, there can be no knowledge of freedom and no knowledge of degrees of freedom. Hence the sharp separation in Kant between freedom and causation.

It is significant that Kant regarded the third *Critique* as mediating between the first and the second particularly in regard to the question of freedom, and further that he regarded the concept of purposiveness or organism as one forced upon science by the empirical observation of living things. That is, he held that living things were of such a nature that it was evident that they must be regarded as wholes which explained themselves, or which at least could not be fully explained from

their external relations alone. That implies that there are certain objects which empirical observation assures us have more claim to be treated as individuals than others. Further, Kant discusses the possibility of viewing the relations of such living things to one another on the analogy of the mutual relations of the parts of any one of them. For while living things must be treated as individuals, they are also obviously in relation to other individuals; and it seems, at first sight at any rate, as though such relations, the relations of individuals of the same species or of different species to one another, were not stateable in terms of mathematical causation. The concept of purposiveness which the investigation of living things requires was not analysed by Kant. Rather he accepted it as exemplified in conscious will. For that very reason he held that, though required in biology, it was inadequate to the facts. But characteristically enough this did not make him seek to obtain a more adequate concept, rather he contented himself with limiting its application, and calling it subjective. Further, Kant held that the application of the concept of purposiveness did not prejudice the application of mechanical categories: rather he held that an organism could only be pro-

perly understood when its changes were expressed in terms both of purposiveness and of mechanism, although he regarded this co-ordination of two such different categories as a difficulty not capable of resolution.

Now the importance of this line of thought becomes clearer when it is observed that in biology at least certain things have *on examination* to be treated as individuals, or at least as having a degree of individuality, if they are to be understood. And such division is quite different from the divisions of the mathematical sciences. The mathematical or geometrical relation will hold wherever in the surface of an object the starting-point of the inquiry is taken: the starting-point is of no theoretical, though it may be of great practical, importance. With living things theoretical explanation, understanding of the relations themselves, depends essentially on the proper delimitation of the object's individuality. A tool which I hold in my hand may be nearer the centre of gravity of my body than the tip of an elephant's trunk is near the centre of gravity of the elephant's body; but I should be making a ludicrous mistake if I thought that for that reason the tool was more a part of me than the trunk a

part of the elephant. The study of living things thus implies the possibility of determining on empirical observation the *real* articulation of things. This point is brought out in a conversation between Bergson and Couturat quoted in the *Bulletin de la Société Française de Philosophie*, June 1901. The passage is worth quoting at length. Bergson, after contrasting physics with the biological sciences, says, "As we rise from the inorganic to the organic, we find ourselves in the presence of facts more objectively willed as facts by nature herself. A living being is nearly a closed circle, closed by nature. A physiological function is a whole relatively closed. The exercise of that function is in its turn a well-defined fact, in spite of its complexity, or rather because of that very complexity, where so much unity is revealed. When finally we come to the elementary psychological fact which borders on the cerebral fact, then we have something defined, isolated, and perfectly distinguished in consciousness."

M. Couturat.—"I am surprised that M. Bergson thinks a physiological fact better delineated than a physical. What could be better defined than an eclipse or more complex and confused than a physiological fact, implying as it often does the whole organism?"

M. Bergson.—"It is not a fact's simplicity which guarantees its real individuality. That simplicity may, on the contrary, in some cases at least, be the sign that the fact has been artificially cut off or constructed by us: while an indefinite complexity like that of a physiological fact, if all its elements are obviously co-ordinated with one another, reveals an objective unity and possesses a real individuality."

Further, if living organisms are more really separate and individual than points in space or portions of inorganic matter, their divisions and articulations are at the same time not so sharp and trenchant as mathematical divisions. Their parts are not really external to one another, but are themselves also organic, and have a claim to be regarded as individuals; and the individuals in turn, as we have seen, have to be regarded as similarly organic parts of other wholes. Further, inasmuch as the relation between the parts of an organic whole can only be apprehended in the parts themselves, the individuality of any organic whole will depend on the particular nature of the parts, and can only be known empirically.

Hence we come to see that empirical observation presents us with different degrees of individuality: that some things are more truly individuals than

others. And in place of the two extremes of the moral individual, viewed in isolation from his circumstances and standing in relation only to other similar moral individuals, and the links in the causal chain whose individuality is entirely artificial and arbitrary, we are presented with an indefinite number of degrees of individuality. Individuality is known and can be recognised empirically in the biological sciences, and we may expect to find certain features characteristic of individuality growing in importance and developing as we rise from the lowest stages to the highest. Further, if individuality and freedom imply one another, the concept of freedom, instead of being a mere ideal of reason, not knowable or demonstrable, may be seen to be of real importance and validity in the sciences of life. The forms of life may be viewed as exhibiting freedom and individuality in progressive stages.

It is this use of the concept of freedom which is most characteristic of Bergson's account of evolution as of conduct, and it depends on the possibility of treating freedom, not as something of which we may be intuitively certain but can have no knowledge, but as a genuine concept which may be empirically recognised, and in virtue of which the

gradual progress from the lowest forms of life to the most complex forms of human thought and action may be better understood. Just because freedom can be recognised empirically, the relation of human life to other forms of life can only be understood by empirical investigation, and there may be a real relation between the biological sciences studied in this sense and what are ordinarily called the speculative sciences. The theory of life may have some real importance for the theory of knowledge.

In some such way, I think, we find an explanation of that characteristic of *Creative Evolution*, or indeed of much of Bergson's work—his argument that the facts of scientific inquiries, such as those made by the physiologist and the biologist, not to speak of the psychologist, are of real importance to the metaphysician. It is an attitude which is naturally viewed with distrust by those who are accustomed to find that an attempt to apply biology or physiology or psychology to the theory of knowledge, usually means, or assumes, that in this way a theory of knowledge, or life, or conduct, can be given in which the uniqueness of the objects of metaphysics is explained away, and that life can be stated in terms of mathematical relations of the inorganic, conscious conduct in terms of unconscious,

knowledge in terms of physical relations. But the scientist or evolutionist who has so applied his science to philosophy has been under the mathematical conception of a science, and has taken for granted that to give a theory of anything means expressing it in terms of something external to it. On these lines a theory of knowledge must be something which really explains knowledge away and ignores its uniqueness, and therefore in this sense there can be no theory of knowledge. But the situation is changed if we find that the sciences of life have to recognise the individuality and uniqueness of their objects; that they are dealing with things as individuals which are in a sense their own explanation, and which are better understood when seen in relation to other individuals: that just as the parts of an organism are distinct and unique and not stateable in terms of each other, and yet the organism is only understood by exhibiting the relation of its parts to one another, so if the different organisms stand in organic relation with one another, each of them will be understood better when exhibited as part of a larger whole, and an understanding of the other parts will contribute to an understanding of any one part; though knowledge of these others does not render un-

necessary observation of and reflection on the one particular part.

So finally, if all living beings stand in some relation to one another, and if man's thought and conscious purposes have any relation to his bodily functionings, and these have relation to the functioning of simpler forms of life, while we must reject any theory which denies the uniqueness of knowledge and conscious purpose, we may at the same time recognise that the comprehension and study of other forms of life will help to the comprehension of knowledge. It will not make it any the less necessary for philosophy to do its own task. We can only understand knowledge by reflecting upon it: but our reflection upon it may be helped if we study it as one among other forms of life. Hence the connection which Bergson asserts between the theory of life and the theory of knowledge. "The theory of knowledge and the theory of life seem to us inseparable. A theory of life that is not accompanied by a criticism of knowledge is obliged to accept as it finds them the concepts which the understanding puts at its disposal. It can but enclose the facts, willing or not, in pre-existing frames which it takes as ultimate. It thus obtains a symbolism which is convenient, perhaps even necessary to positive science,

but not a direct vision of its object. On the other hand, a theory of knowledge which does not replace intelligence in the general evolution of life, will teach us neither how the frames of knowledge have been constructed nor how we can enlarge or go beyond them. It is necessary that these two inquiries, theory of knowledge and theory of life, should join one another and by a circular process push each other on indefinitely." [1]

We are now in a position to appreciate the lines of Bergson's answer to the question: How are metaphysics possible? For the answer to the previous question as to the possibility of biological sciences has shown that it is possible to have knowledge which is not mathematical, which implies the power of recognising real individuals and transcending the artificial distinctions and divisions of practical thinking—a knowledge, therefore, which is not relative in the sense that mathematical accounts of real objects are relative; that in this knowledge we no longer try to know parts of reality in terms of other parts (as Bergson says in the *Introduction to Metaphysic*, our knowledge is no longer symbolic but immediate), but study the articulation of reality: and that if in this way

[1] *Creative Evolution*, p. xiii.

we take a synoptic view of the sciences, we shall not simply be doing the work of the sciences over again or merely finding out what they have done. For the knowledge of an organic whole is different from the successive knowledge of each of its parts: it is the holding together of all these parts in one intuition or one process of philosophical reflection. Thus we shall understand objects which can be studied in detail in separate inquiries, if we can bring the results of these inquiries together and unite them in a single comprehension. In Bergson's words, "An absolute can only be given in an intuition," and again, "But if there is a means of comprehending a reality absolutely instead of knowing it relatively, of entering into the object instead of selecting points of view over against it, of having an intuition of it instead of making an analysis of it; in short, of grasping it independently of any expression and any translation or symbolic representation; that is metaphysic itself."[1]

The possibility of metaphysic thus depends upon the critique of Intuition, which is, as I have said, at once the most interesting and the most difficult part of Bergson's work. In the meantime two points may be noticed about it. It will be an empirical meta-

[1] *Introduction to Metaphysic* (German translation), p. 4.

physic, however much that may seem a contradiction in terms: for reflection upon reality is only possible if we study reality in its details, as the particular inquiries may present it; and further, and for the same reason, it will not be metaphysic in the sense in which Kant understood that term and criticised metaphysic. For inasmuch as it professes to come to a knowledge of the whole through a comprehension of the relations of the parts, if all the parts are not known (and that must necessarily be the case) the whole cannot be completely known. The metaphysic which Kant criticised began with the idea of the whole or of the completed task of knowledge and hypostatised that idea. Bergson's metaphysic will be developing and incomplete.

But that metaphysic should be incomplete and developing is not necessarily a reproach to it, inasmuch as reality as presented in the sciences of life is the same. This suggests the last important element in the problems presented by the biological sciences. In discussing the characteristics of living organisms we have so far been considering only the relations of coexisting things; relations which form a unity as say the parts of a picture do. But the chief difficulty of the biological sciences is concerned with changes in time,

and the characteristic organic unity in life is a unity of elements through a process in time.

No doubt the different individuals and different species and genera coexistent at any one time are related to one another, and can be understood through one another; but they are more closely related to individuals and species preceding them in time. The study of the evolution of animal life is essentially a study of a process going on in time. Now if the relation of the parts of an organic process to one another is such that one part cannot be expressed in terms of another part, it follows that those elements which have not yet occurred in time cannot be got out of the parts that have already occurred; cannot be got out because they are not contained in them, and a development of this kind forces upon us the conviction that the future cannot be said to be "contained in" the present, or the present to have been "contained in" the past. Mathematical causation implies, as we saw, that cause and effect are regarded as discrete and independent; but it also implies that the effect can be stated in terms of the past, that is, eventually, that the effect is all the elements of the past only in a different order, that there is no change except change of order. If we

examine more carefully the mathematical expression of causation, we find that terms like "contained in" or indeed "evolution" are spatial metaphors, whose spatiality is taken seriously; that if causation is expressed as a relation of quantitative equivalence it is a timeless operation and does not really express change. If the concept of causation is fully worked out and expressed in the ideal that the relation of present and future is ideally stateable in terms of a mathematical equation, then change becomes unreal and impossible. Philosophers have found fault with the law of causation because it professes to give an explanation of change but gives none. But actually all knowledge of causation depends upon the perception of continuous change. If we realise that causation does not explain the relation of cause to effect, but from the relation of cause to cause proceeds to the relation of effect to effect, we can see that the time element in causation is taken for granted and not explained, and does not really enter into the calculations. Rather there is always at the back of any causal explanation a basis of observed change, and the real task of a theory of scientific causation when dealing with a complex change is not to show the identity of cause and effect, but to exhibit the complex change as a

system of simpler changes; these simpler changes being merely observed and not explained. In practice, however, the investigator of causal connection tends to concern himself wholly with the quantitative relations and to set up the ideal of completely substituting quantitative calculation for mere observation. He either forgets that all his calculations rest on a basis of perceived change, or what is more important, takes for granted that all changes can be expressed in terms of one simple change, and that therefore the change element in the calculations can be eliminated just because it is colourless and invariable. But once we begin to apply exact quantitative analysis to perceived change we get into difficulties. For we cannot make the indivisibility of the perceived change which has been implied but not included in our calculations, itself a basis of measurement. Changes or movements, though as perceived they are indivisible, are not therefore necessarily identical; each indeed is individual and distinct. Our method of measuring changes comes in the end to be a method of expressing change in the terms of the space through which it moves or the space through which it makes something else move; distance or foot-pounds, or the rise of mercury in a thermometer. The change is

expressed as movement of a uniform body, and its movement is reduced to the space through which it moves. Any attempt, then, to measure changes or state them in quantitative terms, means that all real change in which time is involved, is ignored in the calculations, and we are expressing changes in terms of space. As Kant says in the *Critique*, we can only represent time by drawing it as a line in space. Now it is the great achievement of modern mathematics and physics to have been able to measure movement in this way: to find a means of expressing movements in terms of one another. But calculations in which movements are expressed in terms of their relation to a common measure of spatial distance must break down if at any time *real* movement has to be calculated, or if the relation between changes is not expressed in movements which may be regarded as equivalent to uniform space. The quantitative account of changes is successful in particular spheres just because it is possible to fix upon a uniform observed change which is not explained, but which can be easily referred to as a standard of measurement. But such successful application bears the same relation to real movement as the application of geometry was found to bear to the real articulation of things.

A standard of measurement is taken as a convenient standard of measurement, not necessarily because it represents at all the real articulation of the movement. Modern physics, for example, began when Galileo discovered how to measure movement in terms of the distance traversed in a uniform time (so many feet per second). Recent physicists have suggested the reverse method of taking the distance as uniform and comparing movements in terms of the different times taken to cover the same distance. The second method of calculation is apparently much harder, but has certain compensating advantages. Obviously the difference between these methods has nothing to do with the movement. A falling body does not fall in jumps of feet or of seconds. Neither method of description will in any way express the reality of the movement, but is only a way in which movements of the same kind, *e.g.* of falling bodies, may be compared in terms of distance in space.

These considerations show : (1) That inasmuch as all such calculations imply an unexplained basis which is taken as uniform, they are in their nature partial explanations. The ideal of a universal mathematic, of representing the whole of change in terms of a mathematical equation, would thus

involve an ignoring of the essential conditions under which calculations can be made. (2) That such calculations of change are only valid in so far as change is capable of being expressed in terms of the space through which it moves—in terms of a homogeneous medium—as far, that is, as change or motion is represented as something with no real stopping-places or articulations (or to the nature of which the stopping-places are indifferent), but merely as measurable. Here we come to the real importance of the difficulties raised in the biological sciences in respect to change. For just as an organism is distinguished from a spatial distance in having real boundaries the discovery and observation of which is essential to the study of the organism—or, to put it more exactly, in being a really isolable system, though it may have no sharply defined boundaries—so an organic change will be distinguished from a homogeneous portion of time in that it will represent a real and distinct period, an isolable system, which cannot be studied or understood except as such an isolable system. Here again, in studying the problems set before us by evolution, we are confronted with individuality presented to us in experience, this time individuality in process of time, and any

methods of inquiry which cannot recognise such individuality are foredoomed to failure. The mathematical sciences then, though they can measure movement, can only measure it in so far as it can be regarded as stateable in homogeneous terms; and their failure to take account of changes in the reality of which time is involved will bring out more clearly that they only succeed as they do by ignoring time. Hence, any method which is to study such organic changes must be a method which can recognise time as a reality, and we have to study change from a quite new point of view, if the time taken by the change, and not only the spatial results of the change, are to be studied. These considerations suggested by biology are suggested even more strikingly by the critique of scientific psychology, and the consideration of the method by which psychical processes can be observed. The common characteristic of the method essential in psychology and biology, namely, that it must be a method which regards time as real, leads to this suggestion in the critique of Intuition: the method of metaphysic must be one founded on observation of or reflection on real time. One of Bergson's most fruitful theses is that much of the confusion in early meta-

physics has come from the fact that all have, whether consciously or unconsciously, stated reality in terms of space, and tried to eliminate time; that the attempt to eliminate time is characteristic only of knowledge dominated entirely by conceptions of utility; and that many antinomies, *e.g.* those of Idealism and Realism, will be resolved if we try to state the relation between knowledge and its objects in terms of time instead of space.

To conclude, if we see that mathematical calculation of change does not explain but tends to deny change, we shall discredit the implications of necessity and determination implied in a phrase like "contained in," and see that mathematical causation argues that the present is contained in the past only because it wrongly spatialises change. If we regard time as real, we cannot regard the present as contained in the past, we must recognise the emergence of what is new, recognise that there is creation. Yet at the same time what is new will not be out of relation to the past, any more than is the individual organism out of relation to other organisms; and though the present cannot be *got out* of the past or stated in terms of it, it can be better understood in the light

of it. We come to see that understanding and being able to anticipate or predict are not interchangeable terms. Hence we see a means of escape from the alternatives of a rigid Determinism and a mysterious unexplained Indeterminism, either of which was entirely inadequate to the facts of morals.

Such in very broad outline are the considerations suggested when philosophy, which has hitherto taken for granted that all science must be mathematical, and has framed its own system on the same model, faces the problems raised by the growth of the biological sciences: and these considerations represent the main lines of Bergson's work. The whole structure depends on the criticism of scientific psychology and biology, on such an exposition of the antinomies involved in the notion of a universal mathematic, particularly as applied to these inquiries, as will make it clear that the notion of a mathematical psychology or biology involves a contradiction, and that therefore we must admit the existence of inquiries which do not aim at a mathematical exposition, and which have a method of their own. We shall begin, therefore, by examining Bergson's exposition of the antinomies of scientific psychology and biology, first in his analysis of the application of intensity to psychological states in

Time and Free Will, then in his account of the antinomy involved in the doctrine of psychophysiological parallelism in the article in the *Revue de Metaphysique et de Moral*, November 1904, and the antinomy between Realism and Idealism as stated at the beginning of *Matter and Memory*. Then we shall examine his criticism of "scientific" biology in *Creative Evolution*, keeping throughout to the negative criticism, though noticing in what direction the facts which are recalcitrant to mathematical categories point us in the search for a proper method: then his distinction between time and space, represented by the contrasted series of duration, succession, and quality on the one side, and extensity, simultaneity, and quantity on the other, his connection of the first with conscious experience and freedom, of the second with counting and necessity, as expounded in *Time and Free Will*, and consider how a consideration of the difficulties implied in motion prepare the way for the reconciliation of that contrast which is set forth in *Matter and Memory*. In the next chapter we shall consider Bergson's account of the relation of mind and body in his theories of perception and memory, and the use he makes of the practical nature of thinking. This last subject

will lead us to a consideration of the contrast between scientific thinking and philosophical intuition, and of the account of reality as it appears to philosophy, the most important subjects of *Creative Evolution.*

CHAPTER II

EXPOSITION OF ANTINOMIES

§ 1.—Criticism of Scientific Psychology

Time and Free Will, or *Les Données Immédiates de la Conscience*, is, as the English name implies, connected with the problem of Free Will. Its general thesis is thus described by Bergson in his preface :—

"What I attempt to prove is that all discussion between the determinists and their opponents implies a previous confusion of duration with extensity, of succession with simultaneity, of quality with quantity: the confusion once dispelled, we may perhaps witness the disappearance of the objections raised against Free Will, of the definitions given of it, and in a certain sense of the problem of Free Will itself."

His argument thus professes to be an exposure of a confusion underlying both sides of the controversy in regard to Free Will. That confusion concerns the manner in which the mind or mental

phenomena can be known. Duration is confused with extensity, because mental phenomena are regarded as discrete and external to one another; succession in time is described as though it were a spatial order, and it is assumed that if there is any connection between mental phenomena it must be a necessary connection, and ultimately capable of theoretical treatment. An exposure of this confusion then must imply that existence in time is of a different nature to existence in space, and that mental phenomena cannot be treated as though they were things external to one another in space. This must lead to a distinction between the manner in which mental phenomena can be studied and the methods of ordinary science, which will be a discussion as to the possibility and nature of psychology.

Arguments for determinism are distinguished by Bergson, according as they are based on a theory of the relation of our mental states to one another, or on a theory of the relation of our mental states to the physical world. He describes them under the names of psychological and physical determinism.

Physical determinism is based upon the general ground that liberty of action is incompatible with

the fundamental properties of matter as discovered and exhibited by the physicist, and in particular incompatible with the law of the conservation of energy. But while all physical determinism has this general basis it may take two different forms, one of which involves a theory of the relation of mental states to one another, while the other does not.

In the latter form it is not discussed in *Time and Free Will*, but in the article on Psychophysiological Parallelism, and in *Matter and Memory*, and must be reserved for treatment later. We will only notice here that according to it all action is physical: that there is in this respect no distinction between the actions of living beings and any other physical existences. Reality is regarded as a system of molecules acting and reacting upon one another according to necessary laws: our actions form a part of that system, and are to be calculated like anything else, because they are movements and nothing more. This view then implies that in the calculation of action psychical states may be entirely ignored: they are epiphenomenal, a by-product, and in no sense a determining factor. It is therefore quite possible to hold determinism in this sense and yet deny the possibility of knowing our psychical

states. Such determinism is not really affected by the arguments in *Time and Free Will*, though it has difficulties of its own.

Physical determinism in its other form believes in the necessary relation of action to motive and of motive to external environment without wishing to explain away the difference between psychical and physical. Compatibly with it we might hold, *e.g.* that consciousness is a form of energy different from all other forms of energy and not capable of explanation in terms of them, and yet insist that we could establish by observation and experiment quantitative relations between the psychical and the physical. Determinism would be established if we could discover a law which would enable us to say, "so much motion or external stimulation, so much consciousness." For if consciousness varies quantitatively with the quantity of the physical stimulus, then even if we cannot explain the relation between physical and psychical, we know enough to say that the relation is determined. In just the same way, whilst we do not understand the relation between cause and effect, yet from the relation of cause to cause we can anticipate the relation of effect to effect. Now this form of determinism does

imply a theory as to the relation of mental states to one another. For quantitative relations between two series—here physical movements and psychical states — cannot be discovered without applying quantity to both. If therefore we can show that the relations between psychical states cannot be expressed quantitatively, the basis of this form of determinism is destroyed. This is what Bergson means by saying that physical implies psychological determinism. Both at least assume that psychical states have quantity.

Psychological determinism itself is not concerned with any view of the relation of soul and body. It supposes that our mental states are related to one another — that our actions are necessitated by our feelings and ideas and all the antecedent series of our states of consciousness. It was held most clearly by Spinoza, who allowed no causal relation between physical and psychical (each was an independent attribute of substance), and yet at the same time held that the mental life was to be regarded as a series of states rigidly determined. Very often determinism unites both these last two theories; holds that our sentiments and motives determine our actions and are in turn determined by environment.

Now both these last two forms of determinism appeal to undoubted facts (the physical determinism first described is much more *a priori*), and both are really based on an assumption. Partial knowledge has already shown that our psychical states are partially determined by physical environment, and are in relations of partial determination with previous mental states, therefore, it is assumed, complete knowledge would show complete determination. All that is wanted is to believe that knowledge can proceed further on the lines along which it has already successfully gone. Psychological determinism insists on the fact that connections can undoubtedly be established between our motives and our actions, that actions depend on character, that the more we know a man the more can we say what he will do under any given circumstances. Our mental life is not a mere jumble. Morality would be impossible if it were. It has regularities and displays an intelligible structure. May we not argue that the only reason why we are so incapable of prophesying human action with accuracy is that we know such a small portion of the relevant data, and that really our mental life is a system of necessary relations governed by the law of causation, but a system

largely hid from us. This has plausibility. But the question which has not been considered in this argument is whether connection between our psychical states must be necessary connection, and whether we have gone any way at all to establishing causal relations between them.

The other argument appeals to the undoubted effect on our mental life of physical excitations from without, to the undoubted connection between the mind and the brain and nervous system, to the fact that what we do depends upon our physical powers, and that these are dependent upon our position in the physical world. Psychology shows us relations between measurable physical movements and sensations. Physiology shows us in the study of the nervous system and of cerebral localisation a close connection between our thinking and the structure of our bodies. It seems to be going very little further to postulate a complete correspondence between the movements of the brain and our states of consciousness or between physical excitations and sensations which would leave no room for free will. If a partial correspondence is already discovered, would not more adequate knowledge reveal a complete correspondence?

Now both these forms of determinism, just because they are based on obvious facts, are an advance upon an indeterminism which would deny all relation between character and action, or which would deny the physical limitations with which personality is surrounded. They are not to be refuted by a mere assertion that, although the facts so far bear out determinism, we can never overcome our failure in knowledge. What we have got to show if we are still to believe in liberty, is not that the facts already known are inadequate to establish determinism, but that the conditions implied in determinism are not only more than are known, but are of a kind directly inconsistent with the nature of what is known. Bergson's argument is, that while either form of determinism implies that psychical states stand in causal relations to one another, or can be expressed in quantitative terms of one another, if we examine our actual knowledge of psychical facts we shall find that that knowledge is possible only because we do not regard psychical facts as capable of quantitative expression. He therefore examines what is known of psychical facts, in order to show that in no case are such facts measurable in terms of one another.

Now states of consciousness are not in space, and have clearly no size in the ordinary sense. Yet we do ordinarily suppose that one can be more or less than another. That spatial things can be measured is obvious enough, but it is harder to see how what is non-spatial can be measured, and yet equally hard to deny to states of consciousness some kind of quantitative difference. That the quantity of psychical states, if they can be said to have any, is different from the quantity of things in space, is expressed in ordinary language in the distinction between intensive and extensive quantity. We should ordinarily admit that feelings and sensations have no size, but should assert that they have degree, and that degrees are measurable. That suggests that we can establish quantitative relations between sensations by measurement of differences of intensity or degree.

Our problem therefore leads to an inquiry into the notion of intensive quantity, with the purpose, it must be remembered, of discovering whether we can establish direct quantitative relations between psychical facts. For that there are differences answering to our distinctions of intensity there can be no doubt. The important question is, whether these differences are of the quantitative

nature that determinism would imply. The classical treatment of the conception of intensive quantity is to be found in Kant's *Critique of Pure Reason*, in his account of the Principles of the Pure Understanding. He sums up the result of his discussion there by saying that he has shown that quantity has a quality, namely extension, and that quality has a quantity, namely degree. The two principles of the extensive quantity of all phenomena and the intensive quantity of the real in sensation are the foundations of geometry and physics respectively. If Kant's general account of intensive quantity is right, it would seem at first sight that the difference between it and extensive quantity is not of much importance for freedom. A conception which is at the basis of physics cannot be of very much importance for an exposition of liberty. Kant, as we know from his correspondence, was led to an analysis of the conception from a consideration of what is implied in the laws of falling bodies. His point, put quite briefly, is that we cannot regard reality as constituted by space relations or extension alone; we must in science take account of the qualitative differences of the things that fill space, and regard such differences as effecting

changes in a way that can be measured. For example, in the measurement of weight, with the consideration of which Kant was concerned, we must suppose that the same cubic capacity can be differently filled, and that differences in such fillings are measurable. Two objects may have the same volume, *i.e.* be of the same extensive quantity, and yet have a difference of weight which we can certainly measure. That seems to imply that in the same part of extension there can be more reality at one time than another. There is always something there; there are no holes, and the something is therefore always the same size, and yet what is there can vary, and its variations can be measured. Things of exactly the same size can be of different weights.

If this is so, it would seem to imply that we can measure quantity which is not extensive; and that would be directly at variance with Bergson's contention, elaborated in the second chapter of *Time and Free Will*, that all measurement implies space. But when we come to examine Kant's account of intensive quantity, we find that he sees a great difficulty in the manner of its measurement. The nature of intensive quantity is described by him thus: "There is a gradual transition possible from

empirical to pure consciousness till the real of it vanishes completely and there remains a merely formal consciousness *a priori* of the manifold in space and time; and therefore a synthesis also is possible in the production of a quantity of a sensation from its beginning—that is, from the pure intuition onwards to any quantity of it." And again: "Every sensation is capable of diminution, so that it may decrease and gradually vanish. There is therefore a continuous connection between reality in phenomena and negation by means of many possible intermediate sensations, the difference between which is smaller than the difference between the given sensation and zero or complete negation. It thus follows that the real in each phenomenon has always a quantity, though it is not perceived in apprehension, *because apprehension takes place by a momentary sensation*, not by a successive synthesis of many sensations. It does not advance from the parts to the whole, and though it has a quantity, it has not an extensive quantity. . . . It is a quantity apprehended as unity only, in which plurality can be represented by approximation only to negation."

In this account there are certain difficulties in regard to the relation between sensations and the real in phenomena with which we are not con-

cerned, but in the main the difficulties of the statement are our present interest. Kant seems to be at one and the same time affirming and denying that a sensation can be measured. "It has not an extensive quantity. It is a quantity apprehended as unity only." What kind of quantity can that possibly be? "The quantity is not perceived in apprehension, because apprehension takes place by momentary sensation, not by a successive synthesis of many sensations." On the other hand, he says that the sensation is capable of diminution so that it may decrease and gradually vanish, and refers to "intermediate sensations, the difference between which is smaller than the difference between the given sensation and zero." But if you cannot apprehend the quantity of a sensation, how can you compare the differences between sensations?

A consideration of the facts which suggested the problem may help to an explanation. We may have several objects of the same volume but of different weights and be able to measure the difference of their weights. An object A is twice the weight of another B of the same volume if A balances twice the volume that B balances of another substance C, known to be of uniform mass. Thus we discover the relative weights of A and B by measur-

ing their effect upon C in terms of extensive quantity. That makes Kant say that there must be more reality in one than in the other, but that means no more than that it has been observed that things of the same extensive quantity and of different qualities will produce on something else effects measurable as different extensive quantities—*e.g.* they will fall a different number of feet per second. The qualities can only be given relative degrees because of the discovered law of their behaviour. But in the things themselves we recognise simple qualitative distinctions, and the qualities themselves are discontinuous, and by simply noting the qualitative differences we could not arrange them in the order which the law of their behaviour afterwards prescribes.

On the other hand, if we study qualitative differences in themselves, we find that qualities are like or unlike one another in different degrees. One thing may certainly be more like a second than it is like a third. We can, in certain cases at least, arrange qualitative differences in a series, as we do notes of music or shades of a colour, and this series can be constructed without any measurement of extensive quantity. But one member of the series cannot be expressed as so many times another, for

no one quality can be regarded as a sum or complex of lesser qualities. It is sometimes suggested that in order to have an intense sensation we must go through all the less intense sensations between that sensation and feeling nothing. Kant seems to suggest something of the kind in talking of the possible "transition from empirical to pure consciousness," but he admits that the sensation is a momentary apprehension and one. Our experience of intensity is not the consciousness of a series or gradual transition at all, though such a series may be constructed from the analysis of different experiences. But no member of the series of qualitative differences of degree is in any numerical ratio to another, and there is no sense in which one member of the series contains or is contained in another. If quantitative relations can be established between qualitative differences, it is solely because of the measurable *effect* of these differences on something else. The difficulty in Kant's account comes from the fact that he seems to use the word "intensive quantity" in two senses: in the first, intensity only means that, as in the facts of physics, the measurable effects of things of different quality but the same size lead us to infer that in the same extension there may be more reality at one time

than another; the second is an attempt to explain the meaning of this "more" by the aid of intensive quantity in the sense of a directly observed series of qualitative differences, as though that which had more reality, contained in itself, or was somehow a synthesis of, other less intense qualities of the same series.

In this analysis of Kant's account of intensive quantity, the results which are important for the question of the applicability of quantity to psychical states are these: measurable differences of quality, such as are implied in physics, depend upon establishing the connection between the separate qualitative differences and extensive quantity. On the other hand, qualitative differences arranged in a series by direct observation are not measurable, and the attempt to regard the differences measurable in the first way as implying any kind of summing or synthesis of differences apprehended in the second way involves a confusion. Now our knowledge of psychical facts is derived partly from our observation of correspondences or simultaneities between sensations qualitatively distinct and external phenomena measurable in space, partly by a direct observation of and reflection upon our own psychical states. It is, therefore, easy to fall into the con-

fusion we have noted between the two meanings of intensive quantity. The fact that we can give some kind of degree to almost all our psychical states leads to the assumption that they all have the first kind of intensive quantity and are therefore measurable, and if measurable to be regarded as in quantitative relations to one another; whereas psychical states are only measurable by means of their relation with measurable external phenomena, and the differences between them which can be directly observed are not differences of quantity.

To put this in a way more akin to the lines of Bergson's argument, we may say that, strictly speaking, intensive quantity is a contradiction in terms. Differences of degree between qualities exist, but then they are not quantitative: or they may be measured, but it is not they themselves that are measured, but their relation to extensive quantities. A good instance of the confusion which Bergson is trying to dispel will be found in Galton's *Inquiries into Human Faculty*. Galton is describing inquiries into differences in different people's capacity of discrimination between sensations. Among other things he undertook experiments to test discrimination of weight. He describes the experiments in these words. "A series

of test weights is a simple enough idea—the difficulty lies in determining the particular sequence of weights that should be employed. Mine form a geometric sequence, for the reason that when stimuli of all kinds increase by geometric grades, *the sensations they give rise to will increase by arithmetic grades*, so long as the stimulus is neither so weak as to be barely felt, nor so strong as to excite fatigue. . . . The tests run, objectively speaking, in a geometric series, and subjectively in an arithmetic one."[1] This seems to be a rough statement of what is called Weber's law, but it is put in such a way as to take for granted that the sensations increase arithmetically, *i.e.* that a more intense is the sum of the less intense sensations. Yet, if we ask what "subjectively in an arithmetic series" really describes, the answer is : a series of sensations, between any two of which the subject of the experiment cannot recognise a further discrimination. The quantitative nature of sensations, and the possibility of adding and establishing quantitative relations between them, has been taken for granted.

Another very important example of a similar confusion is given in those theories of ethics which describe action as being determined by the *greatest*

[1] Galton, *Inquiries into Human Faculty*, Everyman edition, p. 23.

pleasure or by aversion to the *greatest* pain. For this implies that the pleasure or pain exists as a certain size, and as being of that size determines our action. Yet when we come to examine the facts, it is impossible to give any meaning to the term "greatest pleasure," except the pleasure which we choose. It is measured by our choosing it, and cannot as being of such and such a size determine our choosing.

In the first chapter of *Time and Free Will* Bergson examines our ways of estimating differences between psychical facts of all kinds. He is not concerned to deny either that certain psychical facts are related to external phenomena which can be measured, or that others can be placed in an ascending scale of degree. Rather, the result of his analysis is to distinguish these two forms of apprehension which are ordinarily confused. By an analysis of our apprehension of feelings and sensations of all kinds, he shows that where we compare psychical facts directly with one another the terms "more" and "less" signify differences in a confused complexity, which can be apprehended but cannot possibly be accurately measured; and that, on the other hand, any exact measurement is got by relation of psychical facts to external phenomena.

His argument will be sufficiently understood if

we take his analysis of two very different kinds of psychical facts. Experiences of joy or sorrow are quite clearly psychical facts where intensity is not measured by reference to external phenomena. We talk of a great sorrow, and think that there are degrees in such experiences. But the expressions *great* or *intense* are not applied to a single detachable element in our mental life, but describe the way in which more and more of our mental life is coloured by a feeling transfused throughout the whole. The more we are in the presence of feelings of this kind, the less can we describe them as elements found alongside of and separate from the rest of our mental life. When, therefore, we experience intensity directly, we do not in any way imply that the mind is a sum or aggregate and its constituents similar complexes. On the contrary, our experience of such intensity is quite incompatible with the conception of the mind consisting of elements which are in causal relations to one another. If from the cause we are to anticipate the effect, we must be able to calculate the amount of the cause independently of the effect. But in this experience of intensity a psychical state is apprehended as greater the more it enters into and affects the rest of our mental life.

At the other end of the scale come our simple sensations, such as those of colour, which seem to differ from such psychical facts as joy or sorrow in that they can be separated in some degree at least from the rest of our mental life and studied apart. We can, like Galton, study powers of sense discrimination without being much concerned as to what the subject of our experiments may otherwise be thinking. At the same time, such sensations are in close connection with external phenomena, and may, of course, be calculated by reference to such phenomena, *e.g.* we estimate differences in illumination in number of candle-power. But if we study them in themselves, without any measurement of their causes or occasions, we observe differences in them. Can such differences be regarded as quantitative? The importance of the example of different shades of colour is that it is often cited as the one instance where psychophysics has definitely established the possibility of measuring sensations. On examination of the facts, we find at first that here, as elsewhere, a number of different factors enter into our estimation of differences of light; that therefore our estimation is due rather to a combination of different qualitative differences than to changes of degree in the same quality.

For example, when we talk of colour having more light on it, really the colour changes. We see qualitative differences of tint, and we substitute, in Bergson's words, "the quantitative interpretation given by our understanding for the qualitative impression received by our consciousness." But though this may ordinarily be the case, in certain experiments in psychophysics the qualitative changes have been isolated, and it is claimed that quantitative relations have been established between them.

What interpretation is to be put upon these experiments? The experiments made by Delbœuf assume that in the increase or diminution of light we perceive different colours, but he tries to show that there is real meaning in talking of the distance between these colours. Two shades of grey are taken and a third is varied until the third is pronounced to be equally distant from the other two. Is not this at last a case where quantity is estimated by the sensations themselves? If the sensation of the contrast between A and C is equal to the sensation of the contrast between B and C, that will mean that two sensations can be equal without being identical, which is what quantitative measurement involves.

Now is *equal distance* here only a metaphor, or

can it be taken so literally that from it one can arrive at a unit of measurement for sensations? The implications of Delbœuf's experiment are seen better in the light of Weber's law. That law states a relation between the increase of the stimulus causing a sensation, and the perceptible difference between one sensation and another, of such a nature that the amounts of stimulus necessary to produce perceptible changes in sensation in any one series have a definite and calculable relation to one another. There is some dispute as to the proper formulation of this law, but little doubt that some such relation between a definite increase in stimulus and a definite change in sensation exists. But that of itself does not imply quantitative relations between the sensations. The increase in the cause is continuous and of extensive quantity; the sensation changes in jumps, from one qualitative difference to another. The psychophysicist proceeds to take these smallest discernible differences as equal to one another, and therefore as capable of treatment as quantities. They are regarded as minima of sensation, and any sensation is regarded as somehow an aggregate of such minima. Here you have the common character of different sensations which corresponds to the common character of different

extensions in virtue of which they can be counted. But this involves the position already examined, that by intensive quantity is meant the perception of the series of the lower grades through which a sensation is supposed to pass. The objection still holds that, as Kant says, the apprehension of the sensation is immediate, and that its degree is not arrived at by counting the intermediate stages. This is the important point. For to regard a sensation as "a sum, obtained by the addition of the minimum differences through which we pass before reaching it," is to say that we measure it through its parts, as in Kant's words we measure a line "by running through its parts and holding them together." But that implies that the parts are separately discernible; whereas in this case there are no parts, there are only the several sensations perceived to be different. The difference can only be known when the sensations have been experienced and placed in a certain series, and neither the series nor any one of the sensations can be regarded as constituted by the differences. The perception of qualitative difference is ultimate. Any facts about the continuous change of the stimuli necessary to produce such different sensations have nothing whatever to do with the question. There

is no justification for calling one smallest perceptible difference equal to another; it means nothing more than that they are smallest perceptible differences. When therefore Delbœuf, as the result of his experiments in colours which are separated by more than the smallest perceptible difference, says that two sensations of colour are equidistant from a third, it means that there are the same number of distinguishable sensations between A and B as between B and C, but does not mean that a difference between two widely separated sensations can on examination be seen to consist or be made up of a number of smaller differences, as the idea of quantity would imply. We have learnt by experience to discriminate such different sensations, and we estimate the difference by the number of sensations we have learnt by experience to place between the two original sensations, not by any quantitative analysis of the difference itself. We are still as far as ever from being able to regard sensations as a sum or from finding any unit of measurement.

In the analysis of the intensity of sensations which occupies the first chapter of *Time and Free Will* Bergson has, I think, proved what he sets out to prove, but it is necessary to consider the limits of the problem he sets himself. He is

examining the view that psychical facts can be stated in terms of one another or regarded as being aggregates of parts. The facts of intensity had been thought to warrant such a view. Now the examination of the two cases we have considered suggests that in so far as intensity is estimated by a direct comparison of mental states with one another, it is not, strictly speaking, quantitative—the intensity certainly does not represent the size of a whole or aggregate of parts: that, on the other hand, wherever definite measurement or counting is possible, it is really the extensive cause or occasion that we are counting. We seem to have only two elements to consider—purely mental states of a vague complexity apprehended by internal reflection, and external phenomena in space. But while in the examination of Delbœuf's experiments it was shown that qualitative differences themselves are not measurable, it was also implied that the qualitative differences can be directly recognised, and further that one colour can be seen to be more like a second than a third. Bergson's criticism refutes any attempt to give such experience of likeness a quantitative expression, but does not deny the experience itself. He is, however, so much occupied with criticising the theory that psychical

states are quantitative, that he does not sufficiently recognise the significance of this experience of likeness and unlikeness and its importance for knowledge. The chapter gives the impression that all qualitative differences are differences of complexity, of a greater or less transfusion over the whole mental life. Now it is only such differences that can be called from direct observation more or less intense, but such differences as different shades of colour, though not quantitative, are separable from the rest of our mental life, and we can recognise degrees of likeness and unlikeness between them. Bergson's neglect of this sometimes seems to suggest that qualitative differences are more truly apprehended the more they are seen confusedly in the whole environment of the mental life, and that on the other hand if they are discerned in external objects, their differences are in the end different relations to extensive quantity. Hence arises the notion that objects as seen in space are seen only quantitatively, and that qualitative differences are confined to the inner life and to what Bergson calls duration. Yet the intensity of a simple state, as Bergson himself says, "is a certain quality or nuance of *that state*."[1] It gets its intensity from association

[1] *Bulletin de la Société Française de Philosophie*, I. 2, p. 61.

with what can be measured extensively, but these nuances display a certain system and regularity of their own which are of great importance in science. For whatever the ideal of science may be, in practice it never banishes the recognition of qualitative likeness and unlikeness. We are continually dealing with qualities which are taken as identical because they are indistinguishable. We may know in science that two qualities which appear to us indistinguishable really contain differences, and yet we assume that the fact that they are indistinguishable is a sign of some identity. And all scientific inquiry depends on the power of distinguishing relevant likenesses and unlikenesses. We cannot make the simplest judgment of the form, "This is an instance of such and such," without using our perception of the relations between qualitative differences. All accounts of particular laws of causation imply the possibility of recognising that the qualities of one object are so like those of another that both may be treated as instances of one law. This becomes of great importance, as we shall see, for Bergson's account of logic, which he sometimes insists is purely quantitative and concerned throughout with identity. But such a logic would not only, as Bergson

insists, be inadequate to the study of facts of life: it would have almost no relation to the study of any empirical phenomena at all.

Further, if all causation implies the recognition of degrees of likeness and unlikeness which cannot be reduced to quantitative terms, the proof of the non-quantitative nature of psychical states is clearly not enough to except some psychical states from being causally related to external phenomena. Nor does Bergson argue that such simple states are not caused. If we are to assert Free Will, we must show that the correspondence which does exist between them and external relations cannot be extended to our whole mental life.

We must then examine Bergson's account of such correspondence, but it may be worth while noting briefly the answer which at this stage suggests itself as to the nature of psychology. A mathematical psychology has been shown to be impossible if psychical states have no measurable quantity, but differences in psychical states can be apprehended without quantitative measurement. Bergson's analysis has disclosed immediately discernible differences in mental states, known by introspection or reflection upon our mental operations. This seems to point to the right

method of psychology being that of philosophical reflection. Yet as each man can only reflect upon his own mental states, psychology might thus seem to be confined to uncommunicable autobiography. For if we know our mental states only by internal reflection upon them, how can we say anything about them to others?

But we have seen that psychical states, though qualitatively different, may be related to quantitatively comparable external causes or effects. Psychology approaches a science in so far as in psychophysics it studies the correspondences or the regular simultaneities between qualitatively distinct mental facts which are treated out of their relation to their mental environment and quantitatively measurable relations. It can never become an exact science, just because to regard such qualitatively distinct mental facts as separable from their environment is to falsify them. As psychology concerns itself more with profounder mental states, it must follow more the method of philosophical reflection, but use for the communication and expression of its results the simultaneities between that which is experienced only by the subject and the external facts which are common or may be common to all observers. Hence the necessity and the difficulty of using

two very different methods—that of philosophical reflection and of empirical study of correspondences—at one and the same time.

§ 2.—Criticism of Theories of the Relation of Mind and Body

This notion of correspondence between psychical states and physical suggests, as we noticed before in passing, an answer on the part of the determinists to the first chapter of *Time and Free Will.* For the physicist may admit that it is impossible to measure or accurately to determine psychical states (these, it may be admitted, are not matter for the scientist), but may contend that as we find an elaborate system of correspondences between qualitatively distinct psychical states and quantitatively measurable external causes, we should study merely the physical movements, and then in the general notion of correspondence find a key to the interpretation or prediction of psychical changes. It will not be necessary to measure the psychical states if they are found to exhibit such qualitative gradeable distinctions as may make the notion of correspondence intelligible.

Some such theory as this is implied in psycho-

physical parallelism. That doctrine may be and often is held without implying any view as to the difference in nature between physical movements and psychical states. We may either hold on the materialist side that the physical motions are the primary reality, while consciousness is epiphenomenal and negligible, or we may hold that movements in the brain and states of consciousness form two series of phenomena which correspond at all points, without necessarily causing one another. But all upholders of psychophysical parallelism agree in postulating a complete correspondence between brain movements and representations. The position, Bergson says, may be variously stated as follows :—

> "Any given cerebral state involves a determined psychological state."
>
> or "A superhuman intelligence which saw the interplay of the atoms constituting the human brain, and which had the key of psychophysiology, could read in the brain as it worked all that passed in the corresponding consciousness."
>
> or "Consciousness expresses nothing more than what goes on in the brain ; it only expresses it in a different language." [1]

[1] *Revue de Metaphysique et de Morale*, 1904, p. 895.

In Bergson's criticism of this doctrine, he is not attacking the notion that there is close correspondence between mind and brain. His criticism, on the contrary, is a preliminary to his own account of the relation as exposed in *Matter and Memory*. He there argues for an elaborate correspondence between psychological and brain states, but only in so far as psychological states issue in action. He implies that any psychological fact involves a concomitant brain change, but not *vice versa*. We are not therefore concerned with the general question whether there is a connection between mind and brain, but whether that connection is what Mr. Bertrand Russell has called a one-one relation. Bergson's contention is that such a theory is self-contradictory.

His argument really bases itself upon the question of individuality or articulation. We may, he says, regard reality from two points of view. We may either accept the divisions and articulations of things as they are given in perception, a view which he calls for the purposes of this argument idealist: or we may hold that these distinctions have no real value — that behind the seeming discrete and separate beings which we see lies the reality of a system of energy, or of acting and reacting mole-

cules which we cannot see, but to which science can penetrate by thought. The doctrine of psycho-physiological parallelism is only possible if we hold both views at once—that is the inconsistency which it involves. To take first the idealist view, psycho-physical parallelism, in the manner which Avenarius has described in his account of Introjectionism, begins by taking the brain as something presented like other things, and then goes on to regard it as the seat or source of representations, something on which all those things presented are dependent although it itself is one among the things presented. But this involves an evident contradiction. For it means that first we take the brain as a part of the whole system and then say that the system is inside the brain. Really, if we take away the brain, we take away one part, and only one part, of the whole reality. You can say, in other words, that movement in the brain is the effect of exterior objects, but you cannot say with any meaning that it *is* the exterior objects, or the representation of them. Brain movement must be regarded as one series of movements related to others, but as being in the world of representation with them. If we seek to avoid this contradiction by saying that while the presentations are dependent on the brain, the things

themselves are independent, we are taking another standpoint, that of separation between presentation and reality.

From this second standpoint reality is more than is presented; behind the presentation there is something different from it. Thus it might seem allowable to regard a brain movement as presented, and also the cause of presentations; as being at one and the same time movement and presentation, on the ground that states of consciousness and movements in the brain are two aspects of a reality which is neither movement nor perception. It may be said: "We are in ourselves conscious of perceiving; we are also conscious of what is perceived; but the reality is not as we perceive it, something separate and independent of us, nor is it perceiving as we are aware of it. It is an imperceivable system of molecular changes, of which our perceiving and what we perceive are but aspects." This is a possible view. But if the brain is made but an aspect of a whole system of reality, the apparent independence and isolation of the subject is denied: it is then impossible to go back to the other view, and treat states of consciousness as one system, and brain movement as another. Why should states of consciousness be parallel to brain movements, and not parallel to

everything else? If brain movements are made the key to states of consciousness they are thereby isolated, because they are isolable in perception: but this contradicts the denial of the real independence of things perceived as separate.

Bergson's argument can, I think, be stated, apart from its relation to alternative metaphysical theories, in a more simple form, which will have the additional advantage of answering the position sometimes put forward, that the metaphysical absurdities of an assumption may be disregarded for the sake of its scientific usefulness. If we state the hypothesis of psychophysical parallelism in a way that implies that corresponding to every movement of the brain is a state of consciousness, or that from a knowledge of the movements of the brain the series of states of consciousness could be predicted, we postulate, as has been said, a one-one relation between the two series of brain movements and states of consciousness. But that necessitates the two series being articulated in the same or a corresponding way. Then we must at once ask whether the relations and discriminations of states of consciousness are in any way of the same kind as the relations and discriminations between movements. Once that question is put,

it becomes obvious that we can only make brain movements the key to psychical states if the latter are external to one another, as are the movements. Here is, I think, the real force of Bergson's exposition of the antinomy. In studying brain movements we may adopt the distinctions discernible but not clear cut in the brain tissues. But what call have we, then, to assume that the psychical series is articulated in at all the same kind of way? If, on the other hand, we go behind the discernible distinctions and postulate movements of atoms or molecules, and suppose for each change in the system of molecules a change in consciousness, we are confronted with the question: On what principle can we possibly discriminate a series of changes in consciousness which can in any way answer, correspond, or be parallel to a system of changes in a system of molecules? If we push sufficiently far the notion of the brain as a system of molecules, we must admit that any divisions or discriminations which *we* can use or operate upon in that system must be as entirely artificial as divisions in a continuous space, and can bear no relation to the organic articulation of states of consciousness: if, on the contrary, we take divisions presented by the cells of the brain tissue or their systems, we are dealing with

a real articulation, but one that has its own characteristics, and there need be no parallelism between that and another series. The whole notion of parallelism entirely ignores the difficulty of real articulation, because, being based on mathematics, it regards the two series as divisible in an indefinite number of ways, so that a point may be taken anywhere in one and a similar point found to correspond with it in the other series. Yet at the same time it is supposed that the physical series would give the key to the second series as we are actually conscious of it; in other words, to the series whose articulation is given in our thinking; not a homogeneous continuum but an organic series. In practice we only work out the parallelism by taking for granted distinctions in consciousness, and looking for similar distinctions in brain movements—that is, we allow the psychical series to be the clue to the physical. To suppose that the process could be inverted, is not to see that without the psychical clue we have no principle by which we can say *this* is *one* movement in the brain and *that* is *another*. Because we discover localisations of functions, we cannot go on to postulate that such localisations can be indefinitely extended, and invert the passage from one series to another. When we

leave experiment and come to theory, the fact that the theory starts with brain movements has the important and prejudicial effect on psychology that it tends to regard states of consciousness as parts cut out of space external to one another, in a way that makes all psychology impossible. Atomic psychology is now given up by almost all psychologists, but it is not recognised how it is implied in the doctrine of psychophysical parallelism. The mistake of supposing that, because the two systems are related, each part of one is related to a definite part of the other, involves treating the psychical series as though it were spatial, yet the terms of the problem cannot allow for the two series both being in space. The metaphysical difficulties in the theory are the consequence of trying to treat the relation between physical and psychical in terms of space, as the word parallel implies. The difficulties in that treatment are stated in Bergson's criticism of Idealism and Realism at the beginning of *Matter and Memory*.

He begins the first chapter of that book by trying to waive for the moment all preconceived theories, and describe the facts as we find them.[1]

[1] It is somewhat startling to find Bergson describing these facts as "images," but as his argument is not affected by any implications which might seem to be involved in talking of being in the presence of "images" rather than "things" or "objects," I have omitted the word in my account.

When that is done we are confronted with the great difference it seems to make whether we take as our starting-point what is implied in the objects of perception as we know them, or what is implied in the act of perceiving or being conscious, and this even though we have to attempt to explain the implications of the side of approach we do not choose, though there seems no method of doing so consistently. On the one hand we have as an apparently obvious and intuitive fact that things are what they are independently of our perceiving them. Science, merely elaborating and working out what is implied in our ordinary perception, tells us of a world of objects acting and reacting upon one another according to definite laws, forming a system of calculable relations. This system is not changed by our perceiving it—it is apprehended, and yet we who perceive it, at least our bodies, are part of it. The effects of other bodies on ours and the actions of our bodies on others take place according to the same physical laws which govern the relations of the other parts of the system. But the relations between living bodies and their environment are obviously of a much more complicated nature than those of some other parts of the system: their actions and reactions, if really

of a piece with the rest of the system, are not so easily calculable. We have to recognise the fact of life and its peculiarity and the comparative individuality of living things. We may of course refuse to regard this difficulty as ultimate, holding that it is a difficulty of greater complexity and nothing more. At the same time we have to admit that one part of this system, namely our own body, is known not only as part of the perceived world but in feeling, and feelings at least *seem* to have a direct relation to action. If I reflect on the part which my consciousness seems to play in the system of movements in the world, "it is present in the form either of feeling or sensation on all the occasions when I take the initiative, and is eclipsed and disappears as soon as my activity becomes automatic and no longer needs consciousness."[1] If we study living bodies we find a peculiar structure, a nervous system and sensory organs, which put the living body in a special relation to its environment. The body as a physical system is in relation to all surrounding physical objects, but through its various sense organs and the structure of the nervous system, in a special relation to certain

[1] *Matter and Memory*, p. 2.

objects and not to others. If we sever a nerve or alter the grey matter in the brain, the body is still in physical relation to other objects, but its perceptions are destroyed, and as a consequence of such destruction the actions of the body are different, the body's sphere of action is limited. The body continues to be a part of the system, but no longer plays a privileged part in it. Now it is possible to contend that it is true that in the meantime all these actions of a living body are not intelligible as part of the physical system, and are made more intelligible by the assumption of freedom only because of the present limits of our knowledge. But we shall then have given up the obvious facts in the name of the consistency of the system, only to find that consistency is impossible. For the fact of consciousness will not fit in with any objective account of the relations of the body to other elements in the system based on the principle of the conservation of energy. If consciousness be a part of the system, then the doctrine that we can regard the body and its surroundings as a system of mutually determined motions breaks down, for consciousness is not a motion. Further, the differences in consciousness which should be the result of the differences

in surrounding objects are not differences in result, but differences actually in the objects of consciousness — consciousness of different objects. Consciousness as a result is immeasurable. Hence the science which tries to measure all the movements of the nervous system, and is on firm intelligible ground in treating of a system of mutually determined motions, has to treat consciousness as epiphenomenal, something which appears at certain stages or circumstances in the development of a nervous system, but is itself not part of it. But its existence, however much it may be minimised, must be admitted, and if admitted it destroys the system based on the conservation of energy.

If, on the other hand, we start with the act of perceiving, the position of the body as centre of the rest of the world is the most obvious fact confronting us. For whether I perceive this or that is dependent on the motions of my body. As I turn my head round from one side of the room to another, what I perceive changes. Thus I get a system "which I call my perception of the universe, which may be entirely altered by a very slight change in my body." [1] Which things lie within my field of vision depends on the position of my body; to

[1] *Matter and Memory*, p. 12.

which of these things I shall attend and what I shall think of them seems further to depend on my past history, on the previous series of my perceptions. The perceived objects are the circumference of a circle the centre of which is my conscious life with its memories and thoughts, and through a knowledge of that alone is intelligible the importance to me of these objects. Thus we may be led to consider that the fact of things being objects of my consciousness is their most important aspect and the key to their nature. In other words, we may take the position of Berkeley. The explanation of purposes and actions is found in the self, with all its complex unity of memory and thinking, and there alone. But here again we commit ourselves to a system which we cannot work out. If we start with the soul's actions and purpose as intelligible, we find these very actions implying elements which are independent of them. For in our action we do not simply impress intelligible form upon an otherwise formless substance. We act upon things already given, with shapes and actions of their own. Only through knowledge of the laws and character of external things can the self use these things for its purposes. We can only act by first discovering what things are independently

of our action. Purposive action is impossible unless we know how things will behave under different conditions, *i.e.* unless we can regard the world in which we are to act as a system of objects dependent upon one another and having mutually determined relations, as a world of foreseeable events. Thus the necessities of action lead us to view reality as something over against the subject—in other words, lead us back to the first system. These are the two systems—the system as perceived, where each part "varies for itself, and in the perfectly definite proportion in which it undergoes the real action of surrounding parts the system of science—and the other, where all vary for one alone, and in proportion as they reflect the action of this special part,"[1] and there is no way from one to another. Conscious action demands something given and predictable over against it. Science of the objective must admit the facts of perception and yet can find no room for them. In Bergson's words, "Realism makes perception an accident, and consequently a mystery. Idealism makes science an accident and its success a mystery."[2]

The way round this antinomy we must leave for examination later. In the meantime we may notice:

[1] *Matter and Memory*, p. 12. [2] *Ibid.* p. 16.

(1) Part of the absurdity involved comes from the use of the expressions "inside" and "outside" in Realism and Idealism. For they imply that reality, however viewed, is exhaustible in spatial terms. Yet external reality cannot hold consciousness *inside* it. Again, there is not really any meaning in the expression "inside" at all in such a phrase as "within" or "inside consciousness," by which idealism has been trying to express a fact ignored by a realism content to insist on the externality of perceptions. The recognition at the same time both of the independence of objects and the importance of the knower and his individuality in determining what *he* perceives cannot be expressed by any spatial metaphors, just because such metaphors are trying to express all the facts as though they formed a picture we could see—a picture which omits individual action and also omits time.

(2) The two systems are both involved in action. If it were not for the fact of action which is inexplicable on purely mechanical lines, the scientific system might ignore or deny consciousness: if it were not necessary to act, the purposing or planning self need not concern itself with the prediction of objects and study of mechanical laws. It is in action that the two systems come together.

Possibly, therefore, an analysis of action may throw some light on their connection.

(3) The study of action must be the study of the individual. For the difficulty comes from the individual having to enter into the two systems at once. Because he is a real individual the agent will not fit into the mechanical system: because he is a finite individual, limited in space and time, he has to act with the help of the mechanical system by knowing things in their repetitions and similarities.

This antinomy therefore arises from an attempt to depict reality wholly in terms of space. Its examination drives us to a consideration of time, and from the recognition of the impossibility of describing in terms of space the progress of the individual in time, to consider how far the problem of knowledge can be stated in terms which assume real time and real individuality.

§ 3.—Criticism of Biological Method

We shall find ourselves led to similar considerations by Bergson's analysis of the difficulties of biological method. There we have worked out on a larger scale the antinomy which results in the

rival claims of consciousness and a mechanical system to furnish the best understanding of life.

Creative Evolution begins with a description of the life of consciousness as it appears to us when we reflect upon it. It is an existence of constant change. Not only do we pass from sensation to sensation, from one act of thought to another: these sensations and thoughts are not fixed entities, but are themselves always changing. Yet this is only half the truth. For these changes form a life or a duration which is one and in a sense continuous. The unity of our mental life cannot be described by saying that all these states of consciousness belong to a self who has them all and yet is none of them. For if we abstract the self from the changing states, we get on the one hand an unknowable and empty self, and on the other a series of discontinuous states, which nothing can unite. The truth is that we carry our past mental life along with us into each act of consciousness. Instead of a series of discrete states side by side and an unchanging self somewhere above or behind them, we find a continuous duration which changes and is yet one, just because the past states do not disappear but enter into the present. They enter into the present not simply in that the present is their

effect, but in that all consciousness of the present is also consciousness of the past. Consciousness cannot be regarded as a series of momentary states: for all consciousness is consciousness of time and hence of change. Time and real experience of time are of the essence of conscious life. Time is irreversible just because all past experience enters into present experience and helps to constitute its character. For that reason each moment of consciousness is unique; though I may be conscious of the same thing at different times, my consciousness of it, being coloured by my past experience, cannot be the same at different points in my experience, and hence there is in conscious life, strictly speaking, no repetition or recurrence.

On the other hand our knowledge of material objects depends upon the possibility of repetitions. In physics, *e.g.* we are dealing with objects which change places, which they may resume. Astronomical calculations are based upon recurrences of similar positions. We can anticipate the future there because we are concerned only with order and changes of order. When the same order is repeated, we are in the presence of the same fact. The lapse of time makes no difference to it. Hence in the calculations of such sciences the lapse of time is

ignored. The measurement of time is the measurement of simultaneities. For each time that the earth repeats its position in regard to the sun, the moon repeats its position in regard to the earth rather more than twelve times. Time is measured by a comparison between such different recurring orders, and its real duration neglected altogether.

Yet just because this measurement of time is relative, it can only be applied to parts of the universe. For it assumes one general time or one general system of changes, and only compares among themselves parts of the whole that is changing. If we think of the whole we can no longer neglect the reality of time. For the very repetitions which we have been measuring imply that the whole changes. Were there no real change, there would not even be discernible repetitions. We can measure time in terms of order in space then, just because we regard the time as belonging not to any of the distinct changes or minor systems of change we are examining, but to the whole of which these orders are but parts: in other words, just because we think that these systems have no time of their own. They are not individuals. They are separately discernible in space; were they not, no measurement could be possible, but they are all parts of

one system in which their individuality is merged. Measurement of time, then, which rests on repetitions cannot apply to the whole. The whole itself must be regarded as having real time or duration. We have the individual consciousness, which experiences its own unique time and displays real change, and the change of the universe, real but too vast to be experienced: between them those changes which, just because they are not regarded as independent, but as being parts in the system, can be measured in relation to one another, as common effects of one pervading force or law.

The question which has to be faced in biology is whether, in dealing with the history of life, we must recognise in our inquiry the real individuality of living bodies and the possibility or necessity of separating the history of life from that of the universe in which it was developed. For if there is no more individuality in the evolution of life than in the history of rocks or the surface of the earth, then we may expect to be able eventually to regard that evolution as a complex of recurring changes, which are indeed separately discernible, but have no real being independent of the one great system of the universe. Their individuality is thus but apparent; we happen to give them separate treatment. If, on

the other hand, their individuality is real, we are confronted with real change, which because real is unique, and displays no repetitions. We shall be inquiring into something which is like the history of our own consciousness, which we may hope will become intelligible when it is displayed before us and we reflect upon it; we shall not, however, be able to predict its future just because we are dealing with a series in which there is no repetition. The reality of change is not inconsistent with intelligibility, but with prediction. An account of evolution, then, will be a history, but not in a mathematical sense an explanation, of what has happened. In the discussion on Psychophysical Parallelism, Bergson has put very clearly the connection between the belief in the universal validity of the category of mechanism and the doctrine that there is no real individuality in nature, in these words: "If there is *one* science of nature (and Kant seems to have no doubt of it), if all phenomena and all objects are spread on one and the same plane, so as to produce an experience unique, continuous, and entirely on the surface (and such is the constant hypothesis of the *Critique of Pure Reason*), then there is only one kind of causality in the world, all phenomenal causality implies rigorous determination, and liberty

must be sought for outside experience. But if there is not *one* science but several *sciences* of nature, if there is not one scientific determination but several scientific determinations of unequal rigor, then we must distinguish between different planes of experience; experience is not simply on the surface, it extends into the depths; finally it is possible by insensible transitions, without any sharp break, without quitting the field of facts, to go from physical necessity to moral freedom."[1]

Now, in dealing with the facts of life we must in some sort accept evolution if we hold the relations between the various forms of life to be intelligible at all; we are not then dealing with what is immediately given as a single history which might correspond to the history of a single consciousness, but with the relations between different animals and different species. Yet these various forms of life present such common features that they can clearly be understood only when studied together. The method of studying life in the light of conscious individuality has the difficulty that any form of life unites in itself parts that may well claim to be individual, and that on the other hand no living thing is isolated. We seem to be dealing

[1] *Bulletin de la Soc. Fran. de Phil.*, 1901, p. 63.

with a continuous process of life from germplasm to germplasm, a process in which the individuals are only intermediaries. Further, this process is not unilinear, but proceeds along different lines in different coexisting forms of life. These coexisting living forms are continually affecting one another in ways which can be described mechanically, and they are affected by their inorganic environment. Can we disregard the element of real individuality and growth in evolution altogether, and give up a psychological interpretation for a mechanical? For a thoroughgoing mechanical explanation will deny the production of any new features in the process, and imply that all development was really contained in the earliest stages. That is clearly expressed in the passage which Bergson quotes from Huxley. "If the fundamental proposition of evolution is true, namely that the entire world, animate and inanimate, is the result of the mutual interaction according to definite laws of forces possessed by the molecules which made up the primitive nebulosity of the universe; then it is no less certain that the present actual world reposed potentially in the cosmic vapour, and that an intelligence, if great enough, could from his knowledge of the properties of the mole-

cules of that vapour have predicted the state of the fauna of Great Britain in 1888 with as much certitude as we say what will happen to the vapour of our breath in a cold day in winter."

Thus we have time explicitly denied. "The present reposed potentially in the cosmic vapour." Differences are mere differences in arrangements in molecules, and understanding is possibility of prediction. Living beings are no more separable or distinct from the general system of molecules than is anything else. In Bergson's words, "Radical mechanism implies a metaphysic where the totality of the real is given *en bloc*, and where the apparent duration of things expresses simply the infirmity of a mind which cannot know everything all at once."[1]

But is such a conception applicable to the facts of life? In the first place, the present state of a living body does not find its explanation in the state immediately anterior, but in the whole past of the organism. If we study changes in growth, such as adolescence or old age, they are only understood in the light of the whole process with which they are continuous. Whereas in a complete mechanical explanation you can find the present state

[1] *Creative Evolution*, p. 41.

contained in any one past state, these phenomena are inexplicable apart from the *history* of the individual organism—in other words, apart from a real period of time. Secondly, while it may be extremely difficult to define individuality, yet it is impossible to make any progress in biology without recognising it. The study of heredity, *e.g.* implies no doubt a continuity between different individuals of the same species which prevents any one of them being regarded as completely individual, but the inquiry is altogether impossible unless it treats that series as a real one, and distinct from the conditions which effect it. Heredity implies a certain common systematisation of the parts of the structure in all the members of the series. The study of heredity must begin with the recognition of some such continuity, *i.e.* with the recognition of individuality. Any explanation, then, which eliminates time and with it real individuality is, even from the scientific point of view, necessarily inadequate.

Considerations of this kind are not new. Theoretical dissatisfaction with a mechanical account of life is as old as the *Phædo*, but mechanism still holds its place largely because of the obvious unsatisfactoriness of the suggested alternative theories. The common criticism of mechanism is based on

the principle that life processes can only be explained in terms of the end, the final or highest form at which the rest of the process was aiming. The process itself must be explained through purpose. But as life is still developing, the end which governs it cannot be merely the highest form that has existed, but something beyond that. If we examine what is involved in this conception of purpose, we shall see that the end which is the explanation of the process must be regarded as apart from and prior to the process as we know it. The process is only the unrolling in time of what without it is eternally real and self-sufficing. Plato, the earliest great critic of mechanism, regarded the Ideas as having such a superior and prior reality to their manifestations. Such a teleology is always open to this objection, that if the end of the process is already real the process is superfluous. What kind of explanation can be given for the reality unfolding itself in time? On the other hand, if the end is not already real and separable from the process, how can it be supposed to be effective? more especially how can it be any explanation of the present process? For if the present be the explanation of the past, must not the future be the explanation of the present?

Bergson's criticism of teleology is that, as commonly held, it makes time unreal just as much as mechanism does. For it reduces everything to the realisation of a programme already drawn up. There is thus nothing really new: apparent newness is the manifestation in existence of what in some other way was already real, and that manifestation teleology explains as little as mechanism explained the only change it recognised—the change in order. Such teleology is only "mechanism from the other end." The impulsion comes from the future instead of from the past, but otherwise there is no difference between them. Some writers have tried to explain teleology by confining it to individuals, and regarding the result of the whole process as the mechanical interaction of the conscious purposes of individuals and their environment. That explanation breaks down because, as we saw, although the study of life forces us to recognise individuality, it also forces us to recognise that any individual is at one and the same time an organism whose parts have individuality and a member of a larger whole. There is in nature no purely internal teleology. This attempt to combine the two categories, to recognise individuals as being in regard to their parts organic and in regard to each

other parts of mechanical system, cannot be made to fit the facts.

This difficulty we have already seen to be inherent in the application of the notion of the conscious life to the general evolution of life. If this application is to be successful, it must get over the difficulty of individuality, and must also see that in its application it preserves the reality of time. Now this teleology, which is only mechanism backwards, comes from an imperfect apprehension of conscious experience. It takes as typical of that experience a purposive action where the end can be conceived and described independently of its realisation. This is the case in manufacture. For efficient manufacture we have to know what we want to make before it is made. That is, our end can be described as being like something else. We must know how the end can be produced, and we can do that only by relying on the law of causation, that like causes have like effects. We regard the end either as identical with something the law of whose production we understand, or as analysable into things of that kind. We can construct the end, then, by pulling a model to pieces and reconstructing it bit by bit. The more efficient our manufacture becomes the more it regards its end as

a combination of standardised parts, the more it sees in manufacture and in all purpose a new putting together of old things. Hence we easily get the notion that in purposive action we can separate the plan from its realisation: for the plan is only the scheme of a new order or arrangement of parts which already exist. Such a teleology is clearly mechanism inverted, for it is based on the essential principle of mechanism, the denial of all individuality and the assumption that all wholes may be regarded as aggregates or combinations of parts whose nature can be treated as identical whether inside or outside the whole.

But such a result of an analysis of manufacture does not apply to conduct, inasmuch as in conduct actions are not merely repetitions or combinations of repeatable parts, but are individual and have individual worth. Conduct cannot therefore be regarded as the execution of a plan: for there can be no means of representing by a plan the action before it is completed. This is most manifestly the case in art. There we have purposive action issuing in the production of something which is essentially individual. The plan or purpose which is stateable before a work of art is produced is entirely inadequate to the end

realised by the artist. That can never be described as the execution of a stateable purpose. The full purpose can only be known in its realisation.

Thus the mistake made by radical teleology is that it regards the coming of the impulsion from the future rather than from the past as the chief difference between purpose and mechanism. Really the essential difference lies in this: that in purposive action the process and its result cannot be regarded as aggregates or arrangements of parts. Hence if we are to apply the psychological interpretation to the evolution of life, because it alone recognises time and individuality, we must realise that we cannot expect from it prediction or anticipation, that it is dealing with a process which can be understood when it has happened but not before. In Bergson's words: "Life progresses and *endures* in time. Of course when once the road has been travelled, we can glance over it, mark its direction, note this in psychological terms, and speak as if there had been pursuit of an end. But the human spirit has nothing to say of the road which is going to be travelled, because the road has been created *pari passu* with the act of travelling over it, being nothing but the direction of this act itself. Evolution, then, should give to each stage

a psychological interpretation, which is, from our point of view, the best explanation; but this explanation has validity and even significance only in a retrospective sense. The teleological interpretation, such as we shall propose it, must not be taken for an anticipation of the future. It is a vision of the past in the light of the present."[1]

Such general considerations, based on the fact that all biology has to begin by recognising empirically the unique nature of life and by using the individuality of species as the basis of explanation, lead in themselves to the refutation of any theory which denies the reality of time or regards the individual as a mere aggregate. But in spite of this the upholder of mechanism might maintain that its explanation supersedes and transcends the individuality which biology begins by recognising, and the support of the prophetic claims of triumph for the mechanical theory come from the success with which that theory has already been applied to and has already broken down the individuality of species as they seemed to be presented by nature. These scientists hold that all that we should believe in is the possibility of extending this process, and, as we saw in dis-

[1] *Creative Evolution*, p. 54.

cussing determinism, no answer to that claim can be satisfactory which is based on the present incapacity of science to explain everything or to go further than it has gone. Such arguments are rightly repelled as mere obscurantism and disbelief in the powers of human knowledge. The only valid answer is that the facts as already explained are inconsistent with the ideal of mechanism; that the breaking down of the old belief in fixed species and acceptance of their transformation leads not to a denial of individuality altogether, but to the view that individuals and species are related to one another as are the parts of an individual organism.

That the theory of mechanism, and the several applications of the concept of purpose we have criticised, furnish satisfactory explanations of some of the essential facts, but are insufficient to explain them all, will become evident if we examine the use made of the notion of adaptation in evolution.

What is ordinarily known as orthodox Darwinianism, though the view was not held rigidly by Darwin, has a clearly mechanical notion of adaptation. For it supposes variations to be accidental in the sense that they are not influenced by the purpose which they are to serve. The preservation of the favourable and useful variations is the work of

environment. Adaptation is effected by the automatic elimination of the unfit. But that the variation should be the result of a mechanical cause operating on mechanical material, involves this great difficulty. The variation cannot survive and become effective in the process of elimination unless conditions are such that it is immediately "favourable." A small accidental variation, therefore, to become effective would have to wait until along with a succession of similar accidental changes it had resulted in the construction of an organ which would aid survival. This sounds improbable, but given sufficient length of time, not impossible. But the problem becomes more difficult when we remember that we have to explain the identity in structure in organs of extraordinary complication along divergent lines of evolution. That an accumulation of accidental variations, on which selection cannot operate, should by quite different paths produce an eye of more or less identical structure in both molluscs and vertebrates seems entirely impossible. It is at least not an hypothesis by which to explain the regular and common features of animal life.

On the other hand, if we consider the parts of a complex structure like the eye to have been brought

together in accordance with a pre-existing plan, this theory throws no light on the gradual development which it is possible to exhibit from the pigment-spot affected by light to the human eye. Both theories have this in common, that they regard a complex structure like the eye as the aggregate of its parts, and suppose that its production involves the bringing together of all these separate parts. Actually the development of the eye from a pigment-spot affected by light is not a process of addition which starts from nothing and ends when all the parts are brought together. It is a series, all the stages of which are complete, and can function (you never have half an eye). We have a growth of complexity, but a complexity that comes not by addition but by a complete simple function complicating itself. The fact that we can exhibit such a continuous development from the earliest stages is equally fatal to the mechanical theory and to the notion of purposive putting together.

Actually, too, variations do not seem to be of the minute kind implied in the first theory. They affect the whole organism, or at least the whole organ. Recent research suggests that adaptations arise more or less suddenly and that they are complete at once. Supposing that the initiating

cause of the variation be mechanical—as, for example, when changes of temperature may cause chrysalis of the same kind to produce different butterflies—yet the details of the variation have no relation to the cause, and are only to be explained by the character of the particular organism reacting to the stimulus of the external cause. If we still call this adaptation, we must realise that we are using that word in a different sense which is no longer compatible with mechanism.

Adaptation in a mechanical sense is exemplified when water assumes the shape of a glass into which it is poured, but in that case the particular result comes entirely from the character of the glass. It is a different kind of adaptation when the result is only explicable through the character of that which is adapted. The solution of a geometrical problem is adapted to its conditions, but the conditions in no way produce the adaptation. Considerations of this kind have led many scientists to bring back the notion of some kind of consciousness at work. The living being tries to adapt itself to the conditions in which it has to live. Adaptation depends upon effort and some kind of will. But that adaptation should be a form of individual effort—one very special kind of individual action—seems to involve the transmission of acquired characteristics in a way

for which there is no warrant. No explanation of evolution is satisfactory which makes development depend on the efforts of isolated individuals. We come back, then, to the view of variation which the empirical study of the facts seems to support. We find that variations are sudden, not coming about by the adding of parts together; that they are not the work of individual effort, rather the species seems to pass through periods of variation. It seems, then, that development is not addition from without, but increase in complexity of what was always an individual whole; and that yet the whole of evolution can only be explained if we regard all living things though individual as members or manifestations of one life, so that the whole is in some sense an individual. Just as we can only explain bees through the hive, it would seem that the development of a species is really made by the species, the species being a real individual, not just a collection of individuals; and that species itself is related in some such way to other forms of life. When we try to work out what these suggestions imply, we come to questions of degree which can only be answered by a much greater empirical knowledge. We can say much more clearly what life is not than what it is. It is enough in the meantime to notice

that in the successful explanations of evolutionary change the strictly mechanical sense of adaptation has been given up. So far from reducing life to merely a part of the system of the universe, they view life as a process with real and distinct changes —changes which are not the result of mechanical environment, but seem to be changes in the history of the species. The life of the species is looked upon as something having its own history or duration; something, therefore, whose individuality is involved in its explanation.

But if the evolution of life be thus interpreted in the light of consciousness, there must always be this difference between an account of evolution and psychology, that in the former we are dealing with the relations of individuals which are related in space; which, therefore, while they cannot be adequately explained by mechanical terms, do act and react upon one another partly by mechanical means. The elimination of the "unfit" by the insufficiency of food is an example of that. Hence our consideration of the difficulties of biological method make it essential that we should understand not only the inadequacy of a mechanical explanation, but its partial adequacy and validity. The mathematical explanation is as essential as the non-mathematical.

CHAPTER III

SPACE, TIME, AND MOTION

We saw that Bergson in his preface to *Time and Free Will* attributed the unfruitfulness of the discussion between Determinists and Indeterminists to a "confusion of duration with extensity, of succession with simultaneity, of quality with quantity." We might sum this list of concepts to be distinguished as time and space. For throughout his work Bergson is insisting on the distinction between the nature of our experience of time and our experience of space. The first he describes as duration, though the English word is a misleading translation of the French *la durée*. It is what each of us apprehends when he reflects on his own conscious life, a process of change in which none of the parts are external to one another, but interpenetrating, where the past is carried on into the present, where therefore there is no repetition, but a continual creation of what is new. Space or extensity is that whose parts

are external to one another, and can be simultaneously apprehended; in space position can be distinguished from what occupies a position, and identity of order and recurrence of the same thing in the same position are possible. The result of the analysis of intensive quantity in the first chapter was to distinguish between the real complexity of psychical states and the quantity belonging to external phenomena with which these might be associated. The criticism of "scientific" psychology was directed against the attempt to regard psychical facts as though they were external to one another and spatial. The result of the criticism of theories of the relation of soul and body in the article on Psychophysiological Parallelism, and in *Matter and Memory*, shows that such relations must be expressed, not in terms of space, but of time. That criticism and the examination of biological methods emphasised the same general contention, that in the sciences of life spatial terms are misleading and confusing, as are scientific methods based on spatial experience; and the conceptions of real change and individuality, as known in experience of and reflection upon our own conscious life, must take their place.

These distinctions, however, have their dangers.

A rigid dualism, which would put on one side consciousness, time, succession, and quality, and on the other the inorganic, space, simultaneity, and quantity, will fit neither the facts of psychology nor of the empirical sciences which deal with external phenomena. We noticed, in examining the criticism of biological methods, that in that science at least we are dealing with living beings which are in spatial relations to one another, though they may also be in relations which cannot be expressed spatially. We have suggested at the end of our account of Bergson's analysis of intensive quantity that he tends to ignore the importance of simple qualitative differences, and the part which the possibility of recognising degrees of likeness and unlikeness between them plays in our knowledge of external phenomena. Bergson himself, in the beginning of *Matter and Memory*, as we have seen, shows how impossible it is to take by itself either of the two systems which he describes, and in the end of that work he makes a most interesting attempt to show how the dualism can be overcome. For, obviously, if we make the distinction of quality and quantity correspond to a distinction of internal and external experience, apply one set of concepts to conscious life as we

are ourselves aware of it and another to what is outside us in space, we are giving this dualism a spatial interpretation after all; and while Bergson begins in *Time and Free Will* with a distinction between the psychical states and external phenomena, in his other works he emphasises more clearly that *all* real changes are inexplicable in purely quantitative terms, and the criterion of the applicability of concepts borrowed from reflection on conscious life rather than from mathematics is seen ultimately to depend upon whether or not in our inquiries we have to take account of the real articulation and individuality of things.

In parts of his writings, and especially in *Time and Free Will*, where the two systems are often separated more sharply than his own reconciliation of them would warrant, Bergson seems to begin by taking for granted what he is afterwards concerned to refute—the mathematical conception of external phenomena, which from the time of Descartes has been prominent in much philosophical and scientific thinking, and to hold in the meantime that those scientists are right who insist that all science implies a mechanical theory of the universe, and that ultimately science will become a universal mathematic. He assumes that logic

which has been constructed from reflection upon the physical sciences expresses the same mathematical ideal. Starting from this position, he is, in *Time and Free Will*, careful to point out that psychical facts are not capable of mathematical treatment, as though they therefore fell outside of the scope of science and of logic, and as though there were two spheres of reality, the sphere of duration and the sphere of space. He afterwards goes on to show that movement also is misinterpreted by quantitative treatment. That *at first* produces the impression that movement is therefore subjective or part of our conscious experience only, and emphasises the difficulty of regarding reality as divided into two spheres—of consciousness, where change and movement and quality are real, and of space, where only the simultaneous and the quantitative exist. It is only in *Matter and Memory* that he brings out the result of this argument as to the nature of motion, namely that since there are real movements in the external world, the mathematical conception of reality must be an inadequate account of external phenomena also. Thus in his final doctrine he criticises the scientific assumptions of a universal mathematic and the logic which is based on such assumptions, insisting that the non-

mathematical methods of inquiry which are alone adequate to the apprehension of conscious life are equally essential to a full understanding of any reality.

The result of this movement of thought is that there is a certain inconsistency or ambiguity in Bergson's account of time and space. In *Time and Free Will* they are treated as the characteristics of two separate spheres of reality, as though time and quality were intelligible apart from space, and space were intelligible as timeless and without qualitative differences. This rigid distinction breaks down when Bergson comes to consider motion, but the fact that the distinction was originally made to separate the treatment of psychical facts from physical seems to influence his account of non-mathematical inquiries throughout. It is therefore of great importance in the appreciation of what Bergson says about the inadequacy of scientific thinking to remember that he means scientific thinking as some scientists have described it, a universal mathematics in which all differences of quality have been eliminated; and that one of the most important results of his criticism is rather to modify the ideal of scientific inquiry than to remove certain spheres of reality entirely from its scope.

In this movement of thought the concept of motion, as we have seen, plays an especially important part. We shall therefore first follow Bergson's connection of number with space and his contrast of duration and extensity, and then ask what modification of this contrast the facts of motion necessitate.

The first chapter of *Time and Free Will* was concerned, as we saw, with an analysis of states of consciousness, with the object of showing that such states cannot be measured in terms of one another, and that such numbering and measuring as is possible in regard to them had always reference to their external causes or occasions, not to the states themselves. On the other hand, we saw that psychical states could be directly compared as regards their multiplicity, but that such multiplicity was not measurable.

In the second chapter Bergson proceeds to elaborate this contrast between two kinds of multiplicity by connecting more closely measurement or number with space. The question before him in the discussion is, as he says, "Does the multiplicity of our conscious states bear the slightest resemblance to the multiplicity of the units of a number?"[1]

[1] *Time and Free Will*, p. 9.

He begins the answer to that question by asking what is implied in the latter multiplicity? Kant, when considering the same question, drew attention to the part played by time in counting, and argued that all measurement means a synthesis of successive parts. The parts must be run through and held together. The number involves a mental synthesis, an intuition of the complex result of successive acts of consciousness. Later writers, accepting this position, and assuming that time is the basis of quantity and number, have held that the experience of succession is all that is necessary for the conception of quantity, and have therefore not unnaturally tried to deduce a notion so essentially quantitative as space from this experience. Lotze, for example, tries to explain the perception of space from the perception of a succession of local signs, and many modern psychologists have followed him. It is not hard, on examination of any such explanations, to show that they are fallacious, and assume the space which they try to explain, and this suggests that we should examine whether the notion of quantity itself does not assume space.

Now Kant, in asserting that number implies a mental synthesis, is concerned with the question, "What must we do in order to count?" His

answer is that we must be able to run through the units and hold them together. If we are only asking what we do when we count up, say to twenty, there would be nothing more to be said. But we may also ask, What do we mean by a sum, or by saying that there are twenty objects? We want to know not only what is implied in the act of counting, but also what is implied in things being summable. In order to know when we have counted all the parts of a sum, we must have over against the successive noticing of units of which we are to make a mental synthesis the whole simultaneously apprehended, if only in order to know where to stop. It is true that we must count successively, but we must also perceive simultaneously. All adding, then, implies a multiplicity simultaneously apprehended, or regarded as simultaneously apprehensible. In time we can perceive a succession only, "but not an addition, *i.e.* a succession which culminates in a sum."[1] A sum implies the simultaneous existence of the parts. Unless we apprehend in a single act the whole to be summed, no counting of successive units can produce a sum. For that we must know when to stop counting. But any reference to a simultaneous multiplicity is a reference to

[1] *Time and Free Will*, p. 79.

space. It is of the essence of space that we perceive in it a number of things at the same time. What else is implied in such terms as "outside one another," or "external"? In counting things we regard them for the purpose of the sum as qualitatively identical, but capable of being separately discernible, and at the same time forming a whole, and this too seems necessarily to imply space. In Bergson's words, "It is scarcely possible to give any other definition of space: space is what enables us to distinguish a number of identical and simultaneous sensations from one another: it is thus a principle of differentiation other than that of qualitative differentiation, and consequently it is a reality with no quality."[1]

These considerations Bergson reinforces by noting another characteristic of a sum—its infinite divisibility. All counting is a definite mental synthesis, and every number as the result of such a synthesis is discontinuous with every other. But when we consider any definite number we regard it as a sum which could be reached in an indefinite number of ways. What is that but to realise that the sum reached in counting any aggregate is determined not by the mental operation of counting, but by the multiplicity simultaneously perceived

[1] *Time and Free Will*, p. 95.

which has been there all the time? And in that multiplicity, though there may be particular purposes which guide our selection, we yet might have chosen units in any way; the sum remains the same, for it is given all at once as a continuous whole; and thus we regard it as infinitely divisible. The infinite divisibility of the sum is another mark of its spatial character. Space is that which can be divided in an indefinite number of ways.

These considerations do not lead to a denial of the importance of time in counting, but they show that measuring involves space. The act of counting involves time, but the nature of what is measured —that which has the number or forms the sum—is spatial. We have already found an instance of this in the way in which we measure psychical states or qualitative differences. For it has been shown that, in all cases where we seem to be measuring a quality or a psychical state, we are really measuring the extensive quantity of its effect or occasion. But the possibility, here instanced, of transferring the quantity of an extension to something in its own nature not quantitative is important. It has its advantages, but it may obviously be misleading, and Bergson is emphatic as to the confusion which has been caused by what he calls the spatialising of time.

We have noticed already how attempts at a quantitative psychology, or a quantitative account of the relations between soul and body, represent mental life as an aggregate or sum of external elements. Bergson's contention is that not only has the nature of psychical states been misrepresented in this way, but that time itself is thereby misunderstood. Time is represented as a homogeneous medium like space, but of one dimension, the moments of which are of the nature of points in space. Yet this is time as we measure it, not time as we experience it, and time is measured only through spatial relations. Time as experienced has the multiplicity of psychical states, and is not something which can be counted. As when mental life is split up into an aggregate of separate elements, it loses its unity and becomes unmeaning, so our experience of any time-process, when represented as a sum or number of moments, loses the unity which is of its essence. The contrast is best illustrated by the difference between hearing a tune and counting the number of different notes in it as they occur. If we count the notes, each note of the tune is taken, but by itself, separate from the rest; the tune has gone.

If, then, the process itself cannot be counted, what is the spatial relation which we count? We

can apply measurement to our psychical states and to time-processes because the psychical and the physical are not two worlds of which we have separate experience. Every psychical fact, if it is a factor in an experience of succession and duration, is an element also in a perceived simultaneity—is part both of an experience of time and of space. Thus, what we do in measuring our psychical states is not to imagine a spatial relation which they do not possess, but to eliminate their temporal relation. We said that quantitative psychology was a study of correspondences. All measurement of time is a counting of such correspondences or simultaneities. We mark time by the concurrence of an event, whether it be our own action or some event of the outside world, with a certain simultaneity in space. We count time by the repetition of such simultaneities. We are concerned only with the simultaneities, not with the real nature of the processes which we measure by them. We may therefore come to call two durations equal, which, as we directly experienced them, were of the most different character and complexity. For in counting time we are concerned only with the simultaneity which marked the beginning of the duration and that which marked its end. Hence, in phrases like

"The time passed quickly" or "The time dragged," we are expressing the difference between what we actually experience and the uniform recurrence of simultaneities in space by which we measure time, and which marks the limits of that experience. In counting we are only concerned with such limits. That a clock should be accurate, it is only essential that the hands of it and another clock should get to the corresponding points marked on the dials simultaneously; or, if we take clocks in general, that, starting from one point at the dial, it should come to the same position again simultaneously with an astronomical recurrence of the position of the earth, and that such a movement should be uniformly divided. It is not essential that the movement should really be of a uniform nature. It is only essential that the hand of the clock should coincide with the positions marked on the dial uniformly. A grandfather clock, whose second hand lurches on to each point on the second dial, may mark as accurate time as a clock whose second hand has an even movement. As Bergson points out, the treatment of time and of all change and velocity in mechanics is of this nature. "Treatises on mechanics explain that duration cannot be defined, but only the equality of two durations," and that is defined

by reference to space. "Two intervals of time are equal where two identical bodies, in identical conditions at the beginning of each of these intervals, and subject to the same actions and influences of every kind, have traversed the same space at the end of these intervals."[1]

Such measurement of time is based, as we have seen, on the fact that every element in a time-process is also an element in a space simultaneity. As measurement, therefore, it is perfectly valid. The mistake arises when the process is thought of as actually a sum or aggregate of simultaneities. For if we eliminate real time altogether, we get a number of simultaneities whose relation to one another we cannot understand. It is possible to mark the simultaneities between elements in a time-process and events in space, only because we experience both the time-process of succession and spatial simultaneities; but if we eliminate the former, and imagine that time is the sum of the simultaneities, then all process and change becomes unmeaning. For the relation between the simultaneities is taken to be that of the parts of the sum to the whole, but that, as we have seen in considering the relation of counting to space, is itself a simultaneity. As the

[1] *Time and Free Will*, p. 115.

relation of the parts that make up a sum is necessary, since for them to constitute a sum the whole must have been there to begin with, so the relation of the simultaneities which are now taken as in their aggregate constituting change must be conceived of as necessary, as somehow all given at once. The spatial metaphors, such as "contained" or "involved in," by which we express the relation of present to past, bear witness to this. But such a conception worked out would imply that change was impossible. We can only understand change by realising that it is incapable of spatial expression, and is something whose reality is only understood as a time-process.

As this fallacious conception of process, which underlies much philosophy and science, has arisen from the confusion of space with time, of simultaneity with succession, Bergson is careful to separate these and to conceive the nature of each separately. In our ordinary experience space and time are both implied. Science, in measuring change, eliminates time: Bergson proposes, if we are to understand the nature of psychical process, that we should eliminate space. Hence we have the contrast between the two spheres of space and time which Bergson thus describes in an analysis of the experience of watching the strokes of a pendulum.

"Outside of me, in space, there is never more than a single position of the hand and the pendulum, for nothing is left of the past positions. Within myself a process of organisation or interpenetration of conscious states is going on, which constitutes true duration. . . . Thus, within our *ego*, there is succession without mutual externality; outside the *ego*, in pure space, mutual externality without succession; mutual externality, since the present oscillation is radically distinct from the previous oscillation which no longer exists, but no succession, since succession exists solely for a conscious spectator who keeps the past in mind and sets the two oscillations or their symbols side by side in an auxiliary space. Now if we try to determine the exact part played by the real and imaginary in this very complex process, this is what we find. There is a real space without duration, in which phenomena appear and disappear simultaneously with our state of consciousness. There is a real duration, the heterogeneous moments of which permeate one another: each moment, however, can be brought into relation with a state of the external world which is contemporaneous with it, and can be separated from the other moments in consequence of this very process."[1]

[1] *Time and Free Will*, p. 108.

Here, therefore, we have the contrast between consciousness, change, and quality on the one hand and space, simultaneity, and quantity on the other, which we noticed at the beginning of this chapter. We must consider the conception of space and time which this view implies, and then ask how it is effected when we come to the consideration of motion.

The two characteristics of space on which measuring is based are, as we have seen, its simultaneity and its infinite divisibility. Space, according to Bergson, is the conception of an empty homogeneous medium: "It is a principle of differentiation other than that of qualitative differentiation, and consequently it is a reality with no quality."[1]

How can such a reality be the basis of counting and measurement? For clearly it cannot be perceived. Bergson follows Kant in giving space an existence apart from its content, and for much the same reason, that all perception of external objects implies space to begin with, or at least implies the perception of a simultaneous multiplicity. But, taking this view, he is confronted with a difficulty, familiar to students of Kant. How can we understand the relation between such a homogeneous medium and the objects that occupy it? If space

[1] *Time and Free Will*, p. 95.

is prior to objects, how can we say that a particular object has such and such spatial determinations? Bergson tries to get over this by making a distinction between our perception of extensity and our conception of space. Extensity with concrete directions is given in immediate perception, "but the conception of a homogeneous medium is something far more extraordinary, being a kind of reaction against that heterogeneity which is the very ground of our experience. . . . What we must say is that we have to do with two different kinds of reality, the one heterogeneous, that of sensible qualities, the other homogeneous, namely space. This latter, clearly conceived by the human intellect, enables us to use clean-cut distinctions, to count, to abstract, and perhaps also to speak."[1]

What kind of existence has this clearly conceived reality? Bergson at times seems to regard it as something which we can conceive as separate from external qualities: for he goes on to argue that time, conceived as a homogeneous medium, must be identical with space. "For homogeneity here consisting in the absence of every quality, it is hard to see how two forms of the homogeneous can be distinguished from one another." This argument

[1] *Time and Free Will*, p. 97.

presupposes that space is conceived of as an independent reality. It is not conclusive, for when we find that Bergson goes so far as to call the directions or dimensions of space qualitative differences, and therefore separable from pure space, we come to see that it is hard to distinguish such a reality from another homogeneous medium because it is hard to distinguish it from blank nothing. Take away the possibility of determinations in space, and space is nothing. As such it cannot be the basis of counting. Spatial determinations are impossible unless we can take points in space. It is true that we must regard space as indefinitely divisible; but an indefinite divisibility implies that each division is made in definite ways, and that units can be provisionally taken in it, and any definite division or system of provisional units that can be added implies some kind of heterogeneity. Things can be added because they are external to one another in space and because *for the purposes of the sum* their qualitative heterogeneity can be ignored. The notion of quantity and of relations in a homogeneous medium can be applied to them in so far as they may be regarded as identical; but if objects were completely identical, if there were no qualitative differences, no discrimination would be possible at all and

therefore no counting. Without counting and discrimination we could not have the conception of that which is merely divisible. We can think of qualitative differences being more and more negligible, becoming more and more like mathematical points, but if all qualitative differences entirely disappeared, spatial relations would disappear with them. Hence the conception of pure space is a limiting conception, based upon the possibility of relatively ignoring qualitative differences, which at its limit is equal to nothing. If the same is true of time, *mutatis mutandis*, time and space may be homogeneous media and yet sufficiently distinguishable as the limits of duration and extensity; as the limits of two mathematical functions may be nothing and yet distinguishable in terms of the functions which they limit.

In *Matter and Memory* Bergson seems to take this latter view of space and time. He regards them not as realities existent by themselves, but as conceived from the necessities of action. "Abstract space is at bottom nothing but the mental diagram of infinite divisibility." The importance of this new suggestion, that the notion of conceived space is the result of the exigencies of action, we shall examine later. However it arises, here we must

again insist that no homogeneous medium alone can be the basis of counting. Counting implies some kind of qualitative difference, and we need for it not only a "schema of infinite divisibility," but a heterogeneous reality in which divisions can be made, because divisions already exist. It is true that the nature of number itself implies the qualitative identity of its units, as space implies a homogeneous medium. But neither this homogeneous medium nor the qualitatively identical units of number can be apprehended apart from our experience of the heterogeneous. All perception of external objects implies space—implies, that is, that we can regard only the spatial character of the objects, their relative position, and ignore their qualitative differences. But if we hypostatise this implication into a homogeneous medium without qualitative difference, and make that in its independence the basis of quantitative calculation, we find that it is indistinguishable from nothing.

We have in this argument been criticising the separation which Bergson makes between quality and quantity. In so doing we only anticipate his criticism of that conception of a purely quantitative external world which is implied in much scientific thinking.

We shall be doing the same in the further criticism which must be made of Bergson's separation between duration and simultaneity, expressed in the words we have already quoted, "Thus within our *ego*, there is succession without mutual externality: outside the *ego*, in pure space, mutual externality without succession." [1]

Our perception of space implies simultaneity, and all counting, selecting, or other forms of mental synthesis imply the perception of a simultaneous multiplicity over against the succession of our mental acts. At the same time no perception is itself instantaneous. All perception takes some time, and therefore we perceive as simultaneous not what we perceive in an infinitely small moment of time (such a description is only a way of trying to regard perception as timeless), but what we are aware of as being continuously present during our perception. The simultaneous implies the permanent which implies a time-process in the subject which perceives it. Still the simultaneity is not itself a time-process and no summing or relations of simultaneities can constitute time. Hence no account of change is possible which begins with what is timeless or simultaneous, and tries

[1] *Time and Free Will*, p. 108.

to explain change in terms of that—as is done, for example, in the Kantian account of substance, and in all thinking where the successive stages which may be discriminated in any process of change are taken as in their aggregate constituting the change. Bergson rightly contrasts with such a reality change and process as we actually experience it in our conscious life. If our perception of space is timeless, we must either try to express motion and change as a sum of simultaneities, in which case we misrepresent its nature, or we must make motion or change psychical, in which case we deny its objectivity. But it is quite clear that we can distinguish between change in our apprehending and apprehension of change. We distinguish between our looking at one part after another of what remains the same and is simultaneously there, and looking at what is actually changing. It is true that we can only perceive change because our perception takes time, but from the fact that a mental process is necessary to apprehend motion, it no more follows that what is apprehended is a mental synthesis than it follows that number is mental because it takes time to count. The difference between simultaneity and change is that simultaneity seems to stand over

against the process of our perception, whereas the time of the change we observe is also the time of our perceiving. But the motion is no less objective than the simultaneity.

Reality then, as we experience it, in which we discern spatial determinations, is not homogeneous, but has qualitative differences: it is not a sum of simultaneities, although we find that it implies simultaneity. This seems to bring us back to Bergson's view, that heterogeneity is "the very ground of our experience," and that the conception of space is "a reaction against that." It does; but to his view, as expounded at least in *Time and Free Will*, with a difference. For we see that the very ground of our experience cannot be merely the heterogeneous: it is only because in that experience we recognise likeness, and what is qualitatively indistinguishable, that we can arrive at the notion of the purely homogeneous: nor can the very ground of our experience be merely heterogeneous change, for we could not arrive at the conception of pure simultaneity, were it not for the contrast in any perception between that which is permanent and that which changes. And upon the possibility of recognising likeness among qualities, and the distinction between rest and change in that

which we perceive, rests our knowledge of external reality.

This is not, I think, inconsistent with Bergson's main position. For him the important question is whether we make identity and simultaneity the elements of reality and try to explain qualitative difference and change in terms of them, or whether, starting with the experience of quality and the experience of time, we can explain how we came to the conception of identity and of simultaneity which quantity implies. The first position breaks down in the attempt to express qualitative differences in terms of quantity and changes in terms of simultaneities. The second position implies a recognition of the fact that change and quality are characteristic of external phenomena as well as of our consciousness. How Bergson explains the part played by quantity and simultaneity in a universe whose reality is change, we shall consider later.

We have seen that space cannot be regarded as a separate sphere of reality characterised by quantity and simultaneity; any purely quantitative reality is impossible: it remains to ask whether consciousness can be regarded as independent of the elements of simultaneity and identity which Bergson has made characteristic of space. Consciousness, or the experi-

ence of duration, is distinguished from space as being essentially process and change. Yet each moment of consciousness, as Bergson says, is "contemporaneous with a state of the external world." This is no mere accident of states of consciousness. Consciousness is of the objective world, and our conscious experience depends for its character upon its contents, however untrue it is to make it a sum or aggregate of such contents. Further, while the characteristic of conscious life is that its elements interpenetrate and that the consciousness of the past enters into the present, it is clear that this happens in the most varying degrees, and that while no element of conscious life can be regarded as completely external to the rest, some psychical states are more capable of such treatment than others. We can, *e.g.* make inquiries into a man's powers of discrimination between sensations, and that implies that we study such sensations in their relation to external causes or occasions, and not in relation to the rest of his mental life; that we can regard such sensations as recurring and as being in normal circumstances of a constant character, although, strictly speaking, recurrence in conscious life is impossible. There are some elements in our conscious life which are more easily known by their

correspondences with external objects than by their position in the whole conscious life.

That the characteristics supposed to distinguish duration from space appear in different degrees in different moments in our conscious life is recognised by Bergson, when he insists that in conscious life there are degrees of freedom. For his proof of the non-quantitative nature of psychical states does not of itself, as we saw, prove the reality of freedom. It only disproves certain *a priori* arguments for determinism. Freedom, in his view, rests not so much on the inexplicability of actions as on the fact that certain actions are to be explained only by the whole of our consciousness, because the past enters into and is held together with the present. What is produced must be new, must be regarded as a creation and not as a predictable result. "There is no need to associate a number of conscious states in order to rebuild the person, for the whole personality is in a single one of them, provided that we know how to choose it; and the outward manifestation of this inner state will be just what is called a free act, since the self alone will have been the author of it, and since it will express the whole of the self. Freedom thus understood is not *absolute*, as a radically libertarian philosophy

would have it: it admits of degrees. For it is by no means the case that all conscious states blend with one another as raindrops with the water of a lake. The self, in so far as it has to do with a homogeneous space, develops as a kind of surface, and on this surface independent growths may form and float."[1] We have noticed that determinism leads naturally to an associationist psychology, and that we can only regard psychical states as caused if we can regard them as external to one another, and the proof of the impossibilities of associationist psychology is part of the argument for freedom. At the same time, associationist psychology has some basis in fact. There is such a phenomenon as the association of ideas. The mistake made by the associationist school was to attempt to explain thinking as a kind of association. But the association of ideas, while it is not thinking, does occur in our mental life, and no one would think of calling it an instance of freedom. If association of ideas determines our action, we are acting as we do because we have met with such and such circumstances, and had such an association suggested to us. Such associated ideas, just because they are elements in mental life, are part of a time-process,

[1] *Time and Free Will*, p. 166.

and yet they can be isolated, though no doubt not completely since something of their nature is affected by the whole mental life in which they find a place.

We see, then, that if there are some actions into which all our past life enters, there are some which are merely on the surface of our life. The fact that it is convenient to measure some of our psychical states, such as sensations of light, in terms of their spatial correspondences, and obviously absurd to measure others, such as joy or sorrow, is a mark of this difference. No state of consciousness is exactly measurable, and the notion of complete correspondence between psychical and physical phenomena is, as we have seen, an ideal which involves a contradiction, and yet there are cases in which a correspondence exists, and with regard to certain parts of our mental life it can be worked out with some completeness. The freedom of our conscious life is also ideal. For in no action is our whole consciousness really concerned. There are no actions which we should not do slightly otherwise were our whole mental life involved in the act. All are partially explained by the external circumstances of the moment. We are free, but free within limits.

The contrast between quality and quantity, in-

terpenetration and externality, which was found to be implied in external phenomena, is found also within mental life; that manifests both freedom and external determination of one state by another as opposite extremes. But phenomena in space seem to become more intelligible the more they are capable of quantitative treatment; mental life, on the contrary, is most intelligible when it is most a unity and most free. Corresponding, therefore, with the contrast between mental life and phenomena in space, there seems to be a contrast in two kinds of intelligibility. Free actions are from the outside the least explicable of actions, from the inside the most intelligible; and as our mental life exhibits both freedom and external determination, it can be studied in two ways, and corresponding to these two ways are two conceptions of time. Just in so far as the association of ideas is a fact in our experiencing—in so far, that is, as we can describe the place of certain elements in our mental life as a position following after or coinciding with others, we naturally think of time as what Bergson calls spatialised time—a determined order of separate events. For we are dealing with that part of our life most determined by its spatial relations.

Contrasted with that is time not constituted by succession since the elements are not separable, but such that consciousness of the past is present, not potentially but actually, in consciousness of the present.

We say our conscious life is intelligible because it is continuous and can be followed; the parts are seen in their relation to and interpenetrated with the past. But if we ask how this is possible, the answer can only be that we can in one act of consciousness, which may take time but remains one, hold together both past and present. Similarly, all thinking and reasoning are but holding together in consciousness elements which previously were isolated. The only test of the irrational is that it is a proposed combination of elements which cannot be so held together. There is in this respect no contrast between our thinking and our action. A rational purpose or a rational action is not one which can be measured or anticipated, but one which we will or effect in the light of our whole life, one which is the outcome of the holding in one act of thought all our knowledge. Hence we call an action free not because it is inexplicable, but because it is the result of a synthesis which is unique and incapable of repetition; which, just because it is an act which

brings together into a new whole the elements of the past, is really a creation.

Contrasted with this is the intelligibility of external relations. In counting we are considering simply the quantitative aspect of objects; and while, as Bergson says, "When we assert that number is a unit, we understand by this that we master the whole of it by a simple and indivisible intuition of the mind"[1] (*i.e.* the apprehension of the laws of quantitative relations is itself a creative act of the mind), yet we think of things as countable in so far as we can ignore all but their relations to external things. Hence it follows that the relations of things that are counted are regarded as necessary, for counting implies relation to the external and ignoring of the qualitative nature of the thing. When we say that elements in the mental life which we can isolate from the rest are not free, but can be understood scientifically, it is not because they are isolated that we can so understand them, but because they are repeatable. For in contrast with our understanding of free action, if we consider how we understand things through the law of causation, we find that there understanding depends on repetition. For in our knowledge of empirical causa-

[1] *Time and Free Will*, p. 80.

tion we do not understand the relation of cause to effect, but having seen one thing become another, when we can regard one cause as the same as another, we can also treat the effects as the same. The necessity of causation is ultimately the necessity of identity.

Hence the contrast between freedom and necessity does not depend simply on the contrast between consciousness and the outside world (for we have seen that the contrast between consciousness, time, succession, and quality on the one hand, and what is without consciousness, space, simultaneity, and quantity on the other, breaks down if we attempt to press it too far); it depends on the distinction between what can only be understood as individual and what can be regarded as identical with other things and studied in its external or quantitative relations.

It is now time to reinforce this view of the relations between duration and extensity by a consideration of the problems raised by the nature of motion and external change. We can distinguish between the manner in which we apprehend the multiplicity of our own conscious life and the manner in which we apprehend what is countable, but motion seems to be inadequately apprehended in either of these two ways. We must regard some

motion as external to us. It is not explicable as part of our experiencing or of the duration of which we are conscious. Rather we know the nature of many motions to be dependent on spatial relations beyond the circle of our experience. Yet if we explain motion in terms of the space it occupies, we eliminate time from it, and time is of its essence.

This latter point has already been treated in considering the relation of change and space, but it will be worth while to examine it in more detail. The physical sciences, such as mechanics or astronomy, deal with motion in so far as it is measurable and therefore in its relation to space. In such sciences we are dealing throughout with space and simultaneities. No doubt all knowledge of motion involves our time-process, for each stage in a motion we are studying is a simultaneity between spatial elements and an element in our time-process, and involves motion objectively perceived, for without the distinction between succession in our apprehending and apprehension of succession, there could be for us no objective motion; but in the measurement of motion, reference to the individual observing is eliminated, and for reference to individual perceived motions is substituted reference to universal motion, manifesting itself in different spatial simultaneities

which alone we can measure. That real duration and real lapse of time are not calculated, is shown by the fact that if the whole process went twice as fast, so long as the relation of the arrangements in space were preserved, it would make no difference to the calculations.

But if we really eliminate the element of duration, we come to a conception of change where time is left out and an account of causal connection becomes simply an account of a succession of states with no explicable relation between them. We come to regard the relation of the past to the present in the way in which we regard the relation of one of the parts of a simultaneity to the rest. As the parts are all there to begin with, so all the stages or different arrangements in space are treated as being there to begin with. Now this process can be carried on quite plausibly so long as we are dealing with particular changes selected out of the whole: for in tracing the conditions of such a change we expose conditions which have previously coexisted; they can be regarded as having all been there to begin with. It still must be remarked that, if all the conditions were there, the effect must have been there also, and we find that at least one condition, namely the bringing

together of the conditions, has been omitted. But this attempt to eliminate time from causation breaks down completely when we apply it to the whole. For we must then regard the past and the present as two multiplicities, each simultaneous but one successive to the other; and the relation between the simultaneities cannot itself have the necessity of simultaneity. The only possible answer which this conception suggests is that the two multiplicities are identical—that the whole never changes. The belief in the necessary relation between cause and effect leads straight to the view that cause and effect are identical, and that there is no change in the whole. But this final elimination of time from causation makes it more than ever clear that time cannot be eliminated without eliminating change, and it breaks down from its obvious absurdity.

This is the contradictory result reached if we begin with a measurement of motion by the space traversed, which marks the limits of the motion but does not explain it. All such measurements of motion imply that motion is the primary fact and space that by which we measure it, but the working out of the mechanical method into a mechanical explanation inverts the relation, makes space or the permanent prior to change, and so, as

we have seen, makes change unmeaning. If we give up the ideal which science sometimes wrongly sets before itself, and examine the actual practice of science, we find that all account of change or motion implies an element of perceived change or motion to begin with, which is taken as given and is not explained. The motions of falling bodies are related to one another in terms of the space through which they fall, but they are all treated as instances of the one general law of gravitation which is not explained but apprehended as a fact. In all accounts of change we must come ultimately to one thing being perceived to change into another, which is the basis of, but is not explained by, the scientific account.

Faced with these difficulties, we may try the other explanation of change which, in *Time and Free Will*, Bergson seems to suggest. As time is of the essence of change, can we understand change otherwise than as we understand time, by living and experiencing it? We experience time as part of our conscious life. There we are at any moment aware of a process going on the elements of which are complex but form a whole. The whole is continuous in that it forms an experience in which consciousness of the past enters into consciousness

of the present. It is something which we can understand when we live through it, but not something parts of which we can predict from the study of other parts. Do we not apprehend the nature of motion more truly in such experience than in any summing of simultaneities?

The difficulty of this position is that while it seems to provide a more satisfactory conception of the general nature of motion, it offers no method by which we can understand actual motions except that of regarding them as elements in our own change and denying their objectivity. But as we noticed, the perception of change implies a distinction between the change in our apprehending and in that which we apprehend. If we hold that change or motion can only be properly understood when conceived as part of a whole which has real duration, nevertheless it is quite undoubted that our experience is not that whole, that we are only looking at such a whole from the outside and only apprehending a small part of it. No doubt we may ourselves be a part of the whole, but we are also separate from it and regard it from without. We must distinguish, then, the change which we experience in ourselves, and may understand through its relation to our whole development, from the change or motion which we perceive. If we insist

that it is the nature of motion or change to be understood as an element in a whole that endures, we must also remember that external motion is not an element in a whole all of which we can comprehend. The very fact that our own duration forms an organic whole which is more or less explicable from within, implies its relative externality to the rest of the universe.

There is this further difficulty in turning from the measurement of motion to the living experience of it in ourselves, that the assumption underlying the rejection of measurement is that motions have individuality and can only be understood through their individuality. But what guarantee have we that the motion which we can perceive in a single intuition as one and indivisible is grasped in its true unity? Rather we know that we meet with motions whose extent is far beyond anything we can grasp in a single intuition, as we may see as one motions that have really different individualities. The motion of the stars we can never see or actually experience as one. The sum of the motions of many minute creatures may seem to us one barely perceptible motion. In what is to us a single intuition we may be dealing only with part of that which can only be understood as an organic whole, or with a sum of such wholes.

Motion, then, seems to be intermediary between our experience of duration in our conscious life and our perception of space. The first seems to offer an ideal of the way in which motion or change might become thoroughly intelligible: but we can only begin to understand motion by recognising its independence of our conscious life and its relation to the space which it traverses. The recognition that motion cannot be expressed adequately in terms of the space through which it moves shows us, not that it ought to be regarded as subjective, but that we can never give a full explanation of external phenomena. The ideal of a universal mathematic which should explain all changes must yield to a recognition that in physics we assume perceived motion to begin with as mere matter of fact. Science seems to eliminate time from its calculations because it takes for granted a reference to perceived time throughout. But the justification of the scientific treatment must lie in the fact that the changes related by science are really connected with one another. Any change involves real time or duration, but that we distinguish a change does not imply that the change we distinguish is presented as a whole, or that the object we distinguish as moving has an individual time-experience such as we have. We experience ordinarily what is only a

part of a larger duration, and we come to understand objective motion better by seeing it to be a part of a great system of motion than, in words which Bergson sometimes uses, by "putting ourselves inside it" or "living it" or "feeling it." For by the former method we may be at least making an approach to apprehending the whole of which the motion we have discerned is but a part: we can feel in ourselves only the muscular sensations that accompany motion. We can only live life, but we can perceive a motion which is certainly not in itself life.

If we hold that motion can only be thoroughly understood when it is seen as an individual system like that of our own consciousness, neither quantitative measurement which ignores individuality altogether, nor our own feelings which would impose our individuality on other things, are adequate for the purpose. How can we, who have a duration of our own which separates us from other things, apprehend truly the duration of things without us? and why is it that in much of our thinking we seem to attach no importance to the real individuality of the things we are examining? These are questions for which Bergson prepares an answer in his theory of perception in *Matter and Memory*.

CHAPTER IV

MATTER AND MEMORY

§ 1.—Bergson's Account of Perception and Memory

We have discussed already Bergson's account of the antinomy implied in all theories of knowledge which start with one or other of the conceptions of consciousness and externality. If consciousness is made the centre of our explanation, the objectivity of knowledge becomes incapable of explanation: science is an accident. If the objects of knowledge as external and apart from consciousness are made the centre, consciousness itself becomes a mystery. Further, we noticed that the contradictions partly arise from the attempt to state the relations between the knowing mind and its objects in terms of space. Words like "inside" and "external" are productive only of confusion. From their use arises the notion that there is a distinction in being between the objects of knowledge and the real, and that if things are within conscious-

ness they must be in some other place from the rest of reality. It is impossible to give an account of perception in terms of space alone. Bergson's way out of the antinomy is to insist that theories of perception which are spatial make the same mistake as theories of causation which omit time. "Questions relating to subject and object, in their distinction and their union, should be stated in functions of time rather than of space."[1] In our discussion of the antinomy we connected with this solution the fact that the two contrasted systems of consciousness and the external world come together in the action of the individual. The fact that in the system of action and reaction which science studies from without there are some actions which can only be understood as the work of individuals, and as not necessitated by the general system, marks the inadequacy of the external account of reality, for individual action implies purpose, and that can only be understood in consciousness. The fact that purpose can only be expressed in action upon a world with laws of its own, makes the analysis of purpose inadequate without a reference to the external world whose nature is independent of purpose. Consciousness issues in action and in-

[1] *Matter and Memory*, p. 77.

determinate action implies consciousness. Therefore the study of consciousness apart from the action in which it issues is as abstract as the study of indeterminate action apart from consciousness. Bergson studies separately the spatial aspect of consciousness which is action and is observable like any other action, and the temporal which implies memory, and then shows how each implies the other, and is in reality inseparable from the other.

In pursuance of this method he insists on regarding as a complex of two quite clearly distinguishable elements what most writers have taken to be the simple irreducible elements in knowledge. Locke, *e.g.*, begins with the assumption that the contents of the mind when it thinks are *simple* ideas. Later criticism has had much to say as to the interpretation he gave to the term idea, but has usually followed him in accepting the simplicity of the content of knowledge; assuming that it is either a mental or a physical entity, one thing or the other; or that it is analysable either into simple elements next one another, or into a combination of universal elements either mental or physical. Yet here the contradiction involved in Idealism and Realism, which we have

already analysed, comes back again. For if we make the idea or the content of the mind when it thinks a mental entity, we get at once either to representationism or to solipsism. Once we suppose that sensations are within the mind and not really objective, there is no getting them out again. If we take the other extreme, and assert that we perceive objects as they are, as though perception were simply transparent, we get into corresponding difficulties. It is hard to deny the fact that what we see depends on our past mental history, that we perceive differently as we have learnt and thought differently in the past, or as we have different purposes in the present. Can we say, *e.g.* that we hear the same sounds when we hear the same language before and after we understand it? Again the very notion that we can learn more about a thing seems to imply that it is at any moment more than we perceive. Such considerations often compel a distinction between the content and the object of knowledge, and it is hard to prevent this distinction from driving us back to representationism again.

Bergson's solution of these difficulties is to deny the simplicity of objects of perception. His analysis of perception begins with a recognition

that all perceiving implies time and also implies a simultaneous multiplicity, that is space. These two elements are taken as ultimate and irreducible. This, of course, is only repeating what has already been said about counting. All apprehension involves mental synthesis, but over against the mental synthesis a multiplicity simultaneously perceived. Both elements, that of the synthesis of time, and the given multiplicity over against that, are essential. If we ignore the second element, we make thought something which constructs its data out of nothing. The two elements are not separable. We have seen already in considering space and time that no perception is timeless, and that simultaneity is a datum of immediate but not of instantaneous perception. But although both time and space are implied in any act of perceiving, we can understand the combination better by observing separately the different nature of each. Similarly we must realise the difference between memory and perception, while recognising that the two come together in ordinary perception. For the difficulties of the doctrine that perceptions are external come from the supposition that we must say of our perception of the present whatever is said of memory and of imagination; that memory differs from perception

only in degree. If these two things are kept separate, it will be possible then to understand their relation to one another.

Bergson begins by isolating pure perception, a process which he describes in these words: "We ask that perception should be provisionally understood to mean, not any concrete and complex perception—that which is enlarged by memories and offers always a certain breadth of duration—but a *pure* perception. I mean a perception which exists rather in theory than in fact, and could be possessed by a being placed where I am, living as I live, but absorbed in the present and capable, by giving up every form of memory, of obtaining a vision of matter at once immediate and instantaneous." [1]

Pure perception, then, is something which we never experience; all our actual perceiving takes time, and is coloured by memory. For every act of perceiving is at one and the same time an element of our conscious life (not so much a member of a series that goes back into time as the act of a being whose existence is duration) and a member of a multiplicity which is simultaneously perceived. The extent to which our memory, or all our conscious life

[1] *Matter and Memory*, p. 26.

whose existence is in time, may enter into any act of perceiving, varies, and as it becomes less, we come nearer to pure perception, but we never actually arrive there: we can see the difference made to perception by the element of time, and can get to pure perception by abstracting the influence of time altogether.

Pure perception is simultaneity. Let us therefore start with the view of reality which simultaneity or space implies, and see what difference is made in it by the fact of perception. We start with a world of things in space relations, acting and reacting on one another. Of this world our body is a part among other parts, and like them it is influenced by all the rest. But over and above this is the fact that the body stands in a particular relation to the other parts of the whole; it is a centre of action. The possibility of its being a centre of action depends on consciousness, in other words on memory and time experience, but it also depends on the fact that in perception the body is related to some things in the external world and not to others. The body as a part of the physical system of the universe is related to all the rest; as perceiving, it is related only to some. This latter relation comes about through the nervous system. If we sever

certain nerves in the body, the body remains influenced by all the rest of the universe, but it loses its particular relation to certain elements in the universe.

In studying perception from the outside in this way, the way suggested by the facts of physiology and the obvious relation of sense perception to the structure of the nervous system, we must keep in mind: (1) That since we have begun with the distinction between time and space, we cannot in analysing the world as given in space and the simultaneous relations of the body and other external things, bring in the consciousness of time. We can only deal with the relations between movements and movements, and ask what difference is made to a movement by being transmitted through the nervous system. How that difference is made, or why it should be that difference rather than another, can only be explained through consciousness.

(2) That as we must not give the brain a double existence in space as motion and consciousness, so we must not give other things a double existence as object and presentation. Instead, therefore, of asking how the object is made into a presentation, instead of supposing that there is more in presenta-

tion than in reality, let us start with the obvious fact that there is less, in the sense that, while the body is in physical relation to all other bodies, it only perceives a few of them, and each of its sense-organs is related only to particular elements in these bodies. Perception is not an instrument of creation or construction but of *selection*. The difference between the world as it is and the world as it is at any moment perceived, which is so puzzling to realism, is a difference of degree not of kind, a difference made by perception selecting not creating.

If we are dealing, then, only with the relation of movements to movements, we can ask what difference in the relation of the body to its environment is effected by the nervous system, since the nervous system is concerned with the transmission of movements. We can trace a movement entering the nervous system and coming out again. What difference does the existence of the body make? Surely a difference of indirectness of reaction between one motion and another. Between reflex action and what we call conscious action there is from this point of view only a difference in complication. In reflex action "a centripetal movement is reflected back at once from the nerve centres of the spinal cord in a centrifugal move-

ment determining a muscular contraction."[1] In conscious action the brain is affected: but that does not mean that somehow pictures or representations are produced, but that the stimulation has choice of one or more systems of centrifugal movements. "The brain appears to us to be an instrument of analysis in regard to movement received, and an instrument of selection in regard to movement executed."[2] As the structure of the nervous system becomes more complicated, the choice between movements becomes greater. Perception is distinct from other movements in that it involves selection: selection from among the physical objects which shall affect the brain and selection in the nervous system of the movements which shall answer that affection. Now, this indetermination cannot be explained from the point of view of space. For indetermination involves time. "The more immediate the reaction is compelled to be, the more must perception resemble a mere contact; and the complete process of perception and of reaction can then hardly be distinguished from a mechanical impulsion followed by a necessary movement. But in the measure that the reaction becomes more uncertain and allows more room for suspense,

[1] *Matter and Memory*, p. 18. [2] *Ibid.* p. 20.

does the distance increase at which the animal is sensible of the action of that which interests it."[1] From the point of view of pure perception we are only concerned with the relations of movements to movements, and with the indetermination inserted between the centrifugal and centripetal movements by the nervous system, though we can see that such indetermination involves time. As any perception is selective, and the reason why one element in reality is selected rather than another is explained in general by the relation of that element to the needs or purposes in life, so, as these develop with the development of memory, the selection operated by consciousness becomes more wide and indeterminate. Nevertheless, in studying pure perception, when we are asking what is there at any one time, we are dealing entirely with movements.

This method of treating perception naturally raises the objection that we are ignoring the element of consciousness and the fundamental difference between consciousness and action. But pure perception is not regarded as something existing by itself, but rather as one of the aspects of all intelligent action, and this method of treatment presupposes all along that intelligent action is a

[1] *Matter and Memory*, p. 22.

whole in which the two elements of consciousness (which implies time and memory) and action (which implies a system of movements in space) can be distinguished, each implying the other. All consciousness issues in action and all indeterminate action implies consciousness, but the sharp separation sometimes made between consciousness and action is unreal. When, for example, we are actively engaged with reality, there is little self-consciousness, though our action is intelligent and involves choice; but consciousness shows itself in a high power of selection from environment and in its direction of responding movements towards a common purpose. In such cases it is impossible to distinguish between acting and knowing. For all our thinking is directed towards and issues in action, and all our acting is the outcome not only of our environment, but of selection from that environment and selection from among the muscular reactions of which we are capable, guided by the organised memories which are present and held together in consciousness. We distinguish thinking from acting only when the indeterminateness of action is developed. Thus we can distinguish a developed process of thought from the action which is its final result, but that

process itself will all the time issue in actions, speaking or writing, or some form of acted symbolism. These we class with thinking because they are instruments in the development of organisation of memory and consciousness, and can be distinguished from the final action in which they result. But the action itself would be inexplicable apart from the memory and organisation of consciousness which is implied in it. Bergson is studying this complex process by separating in thought its two elements, and his doctrine of pure perception implies that all perceiving, as ordinarily understood, involves, besides memory and consciousness, action, but action of a peculiar kind. And we can study its differences from other objective systems of movement, though we can only *explain* such differences through the consciousness which guided our selection of movements.

We can thus see that the question as to whether perceptions are inside or outside consciousness has nothing whatever to do with the question whether they are inside or outside the brain. Every perception is inside consciousness inasmuch as it is a moment in the duration of consciousness, and held together with the memories of the past. But if we are considering perception as a simultaneity, *i.e.*

pure perception, we are dealing with a movement going from the object to the brain, a movement involving selection of outside influences by the brain and selection of an answering muscular contraction. In that system of movement the brain is a part but no more than a part, and the system is a whole. The selection is operated in the external world, and the responding action is directed towards the object thus selected. Nerve processes are essential to the whole system, inasmuch as without them there could be no perception, but there is no question of their *producing* anything inside the brain. The only reason for putting perceptions inside the brain is that we sometimes think of the movements of the nervous system being transformed into representations. But that we have seen to involve a contradiction. It is suggested only because we wish to explain as part of a spatial system what can only be understood as part of a temporal. But it is just as impossible to explain consciousness of time in spatial terms if presentations are in the brain as if they are outside. If in perception we are concerned with selection in view of possible action, our perceptions are where we have to act upon them, namely in space. The difference between what is perceived and what exists is not a dif-

ference of nature as between presentation and object, idea and matter, phenomenon and thing in itself; it is a difference of degree and of selection.

Similarly, the difference between perception and memory is not a matter of inside or outside either. Presentations are not produced in the brain, nor are they stored there. The difference is not spatial but temporal. I can in one act of consciousness hold together the past and the present. That is the essence of conscious duration, and cannot be explained in terms of anything else. At the same time there seems to be a difference between memory and perception which suggests that what we remember is inside us in a sense in which what we perceive is not. The difference is best expressed by the distinction between what can be known by one person only and what can be known by any one. Our memories are accessible only to ourselves. Though what we remember is not inside us, no one else can know it. It is known only through our conscious duration, and we cannot remember everything, but only what we have perceived. But this is only to say that perception implies selection: that there is a difference of quantity between what is and what is perceived, that things can become part of our conscious life only when their action upon

us is selected by our sense-organs. It is because in perception we isolate what we perceive, through the distinction of what affects us as a body among other bodies, and the limited elements of that whole which affect us as a centre of action, that our memories are isolated. What we perceive is external to us, and can enter indifferently into any person's conscious experience as it can be acted upon by any person; but once we have isolated elements of the real world, when we are dealing with our selection and with our action, it has become part of our conscious experience. That, just because it belongs to us as a centre of action, is isolated, and therefore inaccessible to other people except through our expression of our memory in external action. This is consistent with the fact that the relation of subject and object is temporal rather than spatial: for it is of the essence of time conceived of as a duration known in conscious experience to be individual. In all this, as we have contended, Bergson is not giving any theory of perception which should reduce it to anything not itself. The two realities of time and space, or duration and extensity, are still taken for granted as involved in any analysis of perceiving or knowing. Rather because the separation is made, we can see clearly why perception cannot be ex-

plained directly from the side of space or of what is taken as objective, and yet we can see in what manner the spatial side of perception as a system of movements enters into knowing. The movements of the nervous system are as real as any other movements. Perception has a side which the physiologist may study without any attempt to make perception consist simply in the movements of the nervous system. Consciousness is not explained as something extraneous produced by these movements. Rather these movements, as movements, have a character of selection and indeterminate action which from the side of space can only be noted, and can only be understood in the light of consciousness and memory. For what has to be explained is the limitation involved in perception: that limitation is the work of and depends upon the nervous system.

Two objections commonly made to this view of the externality of perception will on examination be found only to confirm it. It is sometimes argued that the fact that our senses need education proves that our perceptions cannot be external. But if our sensations were really internal, no amount of education would teach us to externalise them properly. There would be no possibility of explaining how we

begin such education. There would be no grounds in the sensations themselves for connecting them with one part of space rather than another. If we reflect on the education of the sense perceptions, we see that by it we do not mean learning that these are external, but learning to co-ordinate them. We learn to move so as to be able to touch what we have seen, and all such co-ordination implies space. The truth that such education emphasises is that just because our perceptions are selective they are not continuous. What we perceive depends partly on the motions and positions of our sense-organs, and does not express the whole reality which is there to be perceived, and we have to restore the continuity between the data of the different senses as we have to restore the continuity of the separate points in the visual field which our attention may select as we look this way and that. But it is just because we have selected from a whole that it is possible to unite. "The aim of this education," in Bergson's words, "is to harmonise my senses, to re-establish between the data a continuity which has been broken by the very discontinuity of the needs of my body, finally to reconstruct approximately the whole of the material object."[1]

[1] *Matter and Memory*, p. 48.

The second objection is based on the relation between feeling and sensation. It is assumed that there is only a difference of degree between them, and as it is obvious that pain and pleasure are not without the body, it is assumed that perception cannot be. This argument, that what holds of pleasure and pain must hold of sensation, is frequently brought forward by Berkeley. But pain is localised. It involves extension, but only the extension of the body. The real difference between it and sensation is that it represents not possible action but real action.

This view of perception has started with the body in relation to other bodies in space, and has dealt throughout with movements and difference of character among movements. Starting not with consciousness but with action, perception is seen to be related to the indeterminateness of the body's action and to these movements which imply selection on the part of the body and the nervous system. But if there is to be a centre of action, that must be something other than the selected movements themselves. That centre cannot be anywhere separate in space, for the space is fully occupied with the selective movements. The centre cannot be spatial, but must be temporal. There must be a real centre to determine how the machinery of

movements shall be used. That implies a unity of the past and present, and implies memory. If the indetermination of actions is not mere caprice, there must be an actual knowledge of the past. Hence any account of pure perception must be supplemented by an account of memory, for in conscious action memory and perception meet. The present is a point in the time series of consciousness and in the series of simultaneous movements in space. An act of perceiving has this double aspect, and a study of memory will show how far memory modifies the selection of perception. Memory is related to and is always expressing itself in action, and therefore continually gets confused with the present. Pure perception, as we have seen, is in a sense a postulate or hypothesis, something which on reflection we see must be implied in our perceiving though we never experience it in its pure state. "Perception ends by being merely an occasion for remembering," and yet "an impersonal basis remains in which perception coincides with the object perceived." [1]

But the real distinction between memory and perception is that just because memory is concerned with the past, it is not as such concerned with

[1] *Matter and Memory*, p. 71.

action, for all action is in the present. If therefore memory is concerned with actions only as it is brought to bear upon the present, and if we were right in holding that when we are dealing with actions we have before us simply a system of movements made possible by the structure of the brain and the nervous system, then the notion that the brain is a storehouse of memories must be absurd; for that must be to put the past spatially into the present. But to this it may be objected that physiology has a great deal to tell us about memory, and the connection of different parts of the brain with different memories. Are not such facts conclusive? Bergson's answer is that the brain cannot be the storehouse of memories, but it may contain the machinery by which memory translates itself into action. This appeal to the facts of physiology must be answered by the facts themselves, and it will be seen that they are not consistent with the view that memories are stored up in the brain, but imply that failure of memory comes from a failure in the connection between memory and action.

Now inasmuch as we are claiming for memory that it is distinct from perception and the present, memory cannot be discovered in any such examination of the spatial data as the physiology of the

nerves or brain might conduct. Yet in such an examination we may and do find instruments of action whose presence can only be explained by past history. But in real memory the past is in the present in another sense. It is true of all things in space that though we are aware of them in the present, they may point us back to the past. Our knowledge of the past in memory is something quite different. It is the difference between history based entirely upon archæology and a study of present civilisation, and a history which to these adds written records of the memory of individuals.

In all perception the past may be present in two ways. The nervous system and the brain are continually being modified, and are continually learning new series of actions. In that sense we are said to remember a thing when in its presence we execute the same series of movements which its presence produced in us before. But such memory must be distinguished from real memory when we remember a particular event in the past. If we are learning something by heart, we say that we remember it when we can produce in the right order a certain system of sounds. In the final result the separate distinct times that we may learn the lesson are unimportant in the sense that there is no evidence

in the final result of the separate times of learning. We are concerned here wholly with an action or series of actions. But such a habit-memory must be distinguished from our recollection of each or any separate occasion on which we learnt the lesson, for each of these remains as it was in the past, quite distinct from the habit which now exists and which it helped to produce. The present is action; the past has contributed to present action, but can also be remembered as distinct in that it is in the past. The same distinction is brought out when we realise that habit-memory implies time in the remembering; it is a process; but the recollection of a past process does not involve the time of the process. These two memories are different in kind: the one, recollection, is consciousness of the past; the other is present action. Much confusion is involved in any account of memory or, as we shall see, of recognition and association, by neglecting the distinction between memory and perception and trying to make memory concerned with what is actually present. Recollection implies consciousness of the past, a knowledge where we cannot act.

To this distinction of habit-memory and recollection corresponds a distinction of two forms of recognition. The distinction is expressed by Berg-

son thus: "The recognition of a present object is effected by movements when it proceeds from the object, by representations when it issues from the subject."[1] The study of recognition is of obvious importance in any account of memory and perception, for in it both are clearly combined. We have so far been regarding memory and perception as distinct, yet in fact they are continually coming together. If we are repeating a series of movements, we are acting in the present, but our action may be determined by a recollection, however vague, of the past movement which we are trying to reproduce. The present in action implies memory of the past, and on the other hand memory always tends to establish itself in action, to express itself in some kind of motor reaction, if only in words or rhythmical movement. In recognition we are concerned with the identity of the present with the past, but the direction, so to speak, of the recognition may take two forms. We may be concerned with how we shall act in the present, or may be concerned simply with the remembrance of the individual in the past. And neglect of these differences has led to an inadequate account of recognition. For example, Mill and the Associationist

[1] *Matter and Memory*, p. 87.

school, starting with the assumption that the contents of the mind are individual images united by association, can only explain the fact that when we see A', which resembles A, we act as though we expected B', which resembles B which follows A, by saying that A' reminds us of A, A by contiguity produces B, and B by similarity the expectation of B'. They try to get over the difficulty that we go directly from A' to B' without being conscious of any such process, by postulating a law of oblivescence. Bradley criticises this account with much force, and argues that in such a case there is no reference to previously perceived individuals at all. Only the universal is concerned. His explanation holds good for such instances, but it is quite inadequate to explain cases where we remember past individuals. The two kinds of recognition are different. "To recognise a common object is to know how to use it." Such recognition does not imply the evocation of a past image and a comparison of it with a previous perception. Rather in the past experience the nature of the object called forth an appropriate reaction, and sufficient experience of that kind may establish a habit of such action. All our ordinary activities

[1] *Matter and Memory*, p. 111.

depend on such constant habitual recognition. It is almost automatic, so long as it is functioning properly. It may of course at one time have implied memory of the past consciously distinguished from the present, but it need not have done so. We fail entirely to understand such processes of recognition when we say that they imply judgment. They only imply judgment in so far as we interrupt the automatic reaction to the universal quality recognised in the act to go consciously to our memory of the past. We can act universals without consciously recognising them. This is but part of the general selective nature of perception. Corresponding to this kind of recognition we find a failure to recognise which is quite compatible with memory. In some forms of what is called psychic blindness men are incapable of acting appropriately to the objects presented to them, and yet it can be shown that their memory of the past is intact. Here certainly loss of memory, which is caused by lesion of the brain, does not mean loss of particular memory images, but loss of power to perform certain muscular movements. The first explanation can be shown to be incompatible with the facts.

On the other hand, recognition may have a perfectly definite reference to the past, as when we

say, "That man reminds me of some one I met at such and such a time and such and such a place." Here no doubt we start with a universal, as Bradley insists, or some kind of universal element; but our recognition is directed towards something quite definite and individual in the past. It is directed towards it but is not caused by it; for we may have the feeling, *e.g.* that we have seen a thing before and be unable to remember what it is. We are all familiar with the process of trying to remember a name we have forgotten. Here the result is quite clearly not caused by the name we wish to remember. We must begin with something in the present. We are looking for something definite in the past. Yet we cannot do it by plunging at random into our past. The chances would be thousands to one against our ever reaching the desired result. The failure to reach this definite result does not mean that our memory is gone. It does not imply that the particular memory-object has disappeared; only that we cannot get hold of it: cannot turn our present in the right direction. Memory is distinct from the present, but a memory-object is got at through the present.

We have, then, actions and recollections—the present and the past—set over against one another.

Yet action is always being modified by memory of the past; and memory is approached through action in the present and realises itself in present action. For our action seems to select from memory as it selects from presented objects. It both uses and inhibits pure memory. For the more we are absorbed in action, the more does our memory express itself only in memorised actions and the more is our recollection confined to what is wanted or relevant to the purposes of present action. Only when we are not concerned with action, in a reverie, or in dreaming, do we seem to plunge into the land of memory for its own sake, though even then our memory is suggested by elements in the present.

The past, then, is distinct from the present, and yet it cannot be regarded as having an individual and concrete existence in memory-images. We are still under the misleading influence of spatial metaphor when we picture the past as a series of states, held together in consciousness no doubt, but in themselves separate, as though our memory-objects were discrete things, a series existing in space. The phrase "holding together" is misleading if it implies anything of this kind. Our memories influence and blend with our perception, but not in the sense that they are seen side by side with it. For our

present is not a simultaneous block. It is itself a series of actions. It itself involves duration. In describing it as action, we imply that its reality is change. There is no actual instantaneous present. Our actual present as lived is consciousness of the past and looking towards the future. This is the reality which we experience. If we begin with this changing process in time we can understand the part played by the theoretical present. In Bergson's words, "Having extension in space, my body experiences sensations and at the same time executes movements. Sensations and movements being localised at determined points of the extended body, there can only be at a given moment a single system of movements and sensations. More generally, in that continuity of becoming which is reality itself, the present moment is constituted by the quasi-instantaneous section effected by our perception in the flowing mass; and this section is precisely what we call the material world." [1]

This is clearly but the corollary of the connection between time and space, or duration and extensity, which was elaborated in the last chapter. Externality implies simultaneity, and when we are considering the objects only so far as they exist

[1] *Matter and Memory*, p. 178.

together, we are considering their space relations. Hence arises the conception of space as a homogeneous medium without qualitative differences. But such a medium cannot be regarded as existing or as being known apart from qualitative differences and apart from duration. For if spatial order be a presupposition of perception, so also are qualitative differences and time. We commit a fallacy if we regard the simultaneous or spatial order as something existing in its own right and then try to build up time or change from it. Similarly, when we are considering the nature of mental processes, we may begin by insisting that perception is of external objects, and that it necessitates a connection between the body and other objects mediated by a certain nervous organisation, so that in all perception there is a certain system of mutual relations which may be said "to be there" at any one time. But we commit the same fallacy when we try to represent memory, or mental processes as a whole, in terms of any simultaneous relations of this kind, as though these "pure perceptions" could be thought to exist in themselves and then could be regarded as being stored up in the brain. Really the simultaneous relation is but one side of a reality whose other aspect is temporal, and therefore already involves

memory and consciousness of the past. The same mistake is made in a more subtle way if we give up attempts to place memories anywhere in space, but think of them as existing in the past, in their separate condition, as though the past were a mysterious kind of space, like a fourth dimension. The fault of all associationist psychology is to suppose that perceptions are in their inception clean-cut, independent entities, and then to represent mental life as some sort of arrangement or composition of such entities. We do not really mend matters by calling the constituents of our mental life universals so long as we still think of them as similarly detachable things. If we try to describe the nature of a universal apart from the manner in which we apprehend it, we get into the same difficulties. The mind becomes either nothing at all or a jumble.

The nature of mental processes, then, is not to be conceived as a sum or collocation of a sensori-motor present and a past which is memory or idea, as though there were acts of consciousness which are wholly one or the other, perceptions in which there is no element of time or memories with no connection with or reference to the present. Yet at the same time as in perception we are in contact

with reality in spatial relations which we perceive to be independent of our perceiving it, and thus can distinguish existence in space from being perceived, so in realisation of memory the consciousness that we are remembering implies the independence of the memory from the present consciousness in which we are remembering it, and we can distinguish existence in memory from being in consciousness. As in the case of perception we must think of objects as being there before they are perceived, so we think of what we remember as "being there" before it is remembered. It is the attempt to realise what this "being there" means in the case of memory which leads us to regard the brain or the mind as some kind of storehouse of memories. The truth is that consciousness implies both the existence in space of what is beyond our present perception and the existence of a past in memory of which we are not actually conscious. Our past is known to exist in virtue of its connection with our present consciousness as is what is beyond consciousness in space, but the connection is of a different character. This difference makes us more reluctant to regard the unconscious as existent, because the connections of the real in space have an order and necessity which the connections of memory do not

seem to have; but the latter are none the less real for that. We can understand the nature of mental processes by distinguishing their double aspect of relation to space and of process in time, by realising that memory is distinct from present perception and yet that it continually realises itself in present perception. In all intelligent thinking the past is continually used in guiding our selection among present movements, and present perception in its turn is used but as a symbol of the past. All our memories are "*there*" to be used, but not jumbled together in a kind of lucky-bag in which we plunge at random, but connected together by laws.

This organisation of mental life is manifested especially in what are called general ideas. Bergson, in his account of them, points out how nominalism and conceptualism alike err in regarding but one aspect of our thinking. Nominalism, which is connected with the doctrine of association, thinks of the mind as a collection or storehouse of individuals, and places their unity only in the artificial action of naming, yet can show no explanation of why the different individuals, if only different, have the same name. The doctrine of association is made to depend on the law of contiguity, although in memory, as conceived by association, every "idea"

is contiguous with every other; and on the law of similarity, without any explanation being given of how there can be similarity between individual ideas and although actually any idea has some element of similarity with any other. Conceptualism starts with the universal, with the unity implied in recognition, without seeing that such unity does not exhaust the character of the several objects and is not an isolated element in them, but is only seen in individuals. All attempts to describe a general idea either as a collection of individuals or a separable universal are attempts to describe it as a separate *thing*, while actually it is inseparable from the act in which the individuals are apprehended as alike. Generalisation, according to Bergson, begins with the identical motor reaction called out by the identity in the quality. Pure "similarity acts objectively like a force."[1] There can, as we have seen, be recognition in action when there is not conscious recognition. Every general idea implies what has been described as "identity of motor reaction," but we are neglecting one aspect of it when we describe it thus; for that motor reaction is guided by and implies memory of individuals. Recognition of similarity may express itself in an identity of re-

[1] *Matter and Memory*, p. 207.

action towards individual sensations which are always more varied and changing than the reaction they call forth; it may in more developed thinking express itself in the artificial reactions of language, but such recognition is only possible because the memory of other perceptions is synthesised in it, and the general idea is neither the individual memories nor the action which manifests it, but, in Bergson's words, "the current which goes from one to the other."[1] The nature of mental operations is apprehended in this process; we understand the nature of a universal when we judge, but we cannot describe it in terms of the elements we can discern in the process.

§ 2.—Consciousness and Action

In this account of generality Bergson is mainly concerned with the point we have just mentioned —the nature of mental operations and the inadequacy of any attempt to express them in static terms. His account of perception and memory and their relation has confirmed his first description of duration as a process where there is a mutual interpenetration of parts and the past enters into

[1] *Matter and Memory*, p. 24.

the present, and where there is continually new creation. The purpose of this account is, as he says, mainly psychological. For that reason he confines himself more to the examination of elementary forms of mental processes, not working out the application of his views to more developed thinking. But there are in this theory of perception and memory and their relation points of more than psychological interest which it may be well to consider.

In the first place it is important to notice that Bergson's account of the process and change of mental life implies within that process the contrast of the changing and the permanent or at least of the relatively variable and the relatively stable. The association of ideas, the recognition of similarity and difference, are impossible of explanation unless we recognise the contrast between the instability of sensation and the invariable working of the motor reaction.[1] A mental life in which all is difference is as impossible as one in which all is identity. A consciousness in which change and variety is most evident is a dreaming consciousness. One requisite of intelligent action is throughout the elimination or ignoring of differences and the

[1] *Matter and Memory*, p. 208.

apprehension of essential identity. The processes of thought are creative, but the new can be created only on the basis of recognition of the relation of the new situation with the old. Habit is as essential to thinking as it is to action, though thinking and action which are only repetitions of acquired habits are of little value. Yet this element of stability and identity is often obscured in Bergson's account of mental life. He insists so strenuously that habit or automatism is a bad master, that he sometimes seems to forget its value as a servant.

More important is Bergson's insistence that mental operations can only be understood in their relation to action. We have noticed already that the distinction between memory and perception is for Bergson a distinction between thought and action. "The past is idea: the present is ideo-motor."[1] Pure perception he has explained in terms of action, for our bodily structure and nervous organisation are directed towards action: the nervous organisation being an instrument of movements and movements only. It is otherwise, of course, with pure memory, but even memory is realised and expresses itself in action.

This doctrine of Bergson's, that the "orientation

[1] *Matter and Memory*, p. 74.

of our consciousness towards action appears to be the fundamental law of our psychical life,"[1] has two aspects, which it is well to distinguish. In the first place we have his contention that the difficulties of most accounts of knowledge come from their isolation of thought from action, and that we must realise that as every mental act has spatial relations and is in a process involving time, so it is both thought and action, and these two aspects are complementary. In the second place Bergson holds that the influence of action upon thought distorts our apprehension of reality, and must be overcome if we are to apprehend reality as it is. The first point has already been considered in relation to Bergson's account of perception and memory. Pure perception is, according to that, a system of movements, differing only from other relations of bodies in space in its selective character, that in its turn depending on the synthesis of past and present in consciousness. The distinction between pure memory and habit-memory is again a distinction between thought and action, as is the distinction between the two kinds of recognition. We have seen how failure to distinguish between memory and perception

[1] *Matter and Memory*, p. 234.

made it impossible to understand the nature of mental operations, and how the distinction between two kinds of recognition is a clue to the difficulties connected with the nature of general ideas.

It might be objected that while in rudimentary mental life it may be hard to distinguish between thinking and acting, in more developed thinking there is no difficulty. It is true that Bergson in *Matter and Memory* is more concerned with rudimentary forms of thought, with universals which are acted and not thought, and with the association of ideas; yet he suggests that in developed thinking symbolic action in the shape of words takes the place of the simple motor reaction to external environment. But speech and writing, and all forms of language, are action, and the expression in words of the organised memories of the past is as essential to developed thinking as more immediate and obvious motor reactions are to elementary perception. The relation of language to thought is not easily stated, yet it is clear that while language and thought are no more identical than the simple motor reaction and the whole mental process of which it is the manifestation, yet all developed thinking implies and is impossible without language. The bare identity of the word is the mark of a rich com-

plexity of memory and action, and the meaning of a word is nothing simple or static, but varies with the richness of the experience which it synthesises. Yet without the fixity and definiteness given by words thinking would be impossible. When Bergson says, then, that all our consciousness is orientated towards action, that may be only another form of Croce's assertion that thought cannot be separated from its expression. And whilst agreeing with Bergson's argument against a view which would so separate consciousness and action as to make them two separate forms of mental life, each capable of explanation by itself, we must remember that the use of words and symbols of expression in developed thinking is action of a kind that serves in its turn the ends of thinking or that organisation of memory and past experience which is the presupposition of action. Hence, we are wrong to regard any existing present action as necessarily the end to which previous organisation of memory has contributed. It is wrong to think of action over against thought as being necessarily final. In many cases present action, as writing or reading, for example, is used but as a symbol of the past, and the action in which thought issues is, in its turn, used for the development of

thought. This does not mean that action is ultimately subordinate to thought, but that these two aspects of mental life react upon one another. Further when Bergson talks about the instantaneous present, which is action, he is employing the term action in an abstract sense. For our actions imply time and duration, and the extent of time, which is the present of an action, depends upon the scope of the purpose which inspires it.

This "orientation of consciousness towards action" has another implication. Its consideration will lead naturally to our examination of Bergson's view, that that orientation distorts our apprehension of reality. If thought be essentially related to action, it must necessarily be in contact with reality. There can be no meaning in the opposite suggestion. This consideration is often cited by Bergson in refutation of all merely subjectivist theories. Not only does he insist that perceptions are external, he describes the primitive universal, which is acted and not thought and which is the basis of the thought generality, as "similarity acting objectively like a force." Thus we cannot reduce the reality of universals to that of "points of view" or "identity of motor reactions," as though reality itself had none of the characteristics

of the content of thought. For identical motor reactions towards objects in which there was no identity would be mistaken actions. Hence, that organisation of thought, which we have seen to imply universals, must follow the nature of the real, because it is based on universals discovered in action, and in turn looks forward to action. If the laws of number and of geometry, for example, were simply the creation of thought out of touch with reality, they could never manifest themselves in action. All thorough-going subjectivist views, which divorce the mind from reality, divorce it also from action, and suppose it to have a peculiarly speculative interest; they describe the mind as *looking on* at a procession of ideas or its own states.

Yet if the relation of thought to action ensures that thought is in contact with reality, it also makes possible an explanation of its divergence. Clearly there is a distinction between the object of thought and reality, but it is a distinction, as Bergson insists, of quantity and not of nature. We noticed in Bergson's account of perception that he argues that perception is external, but differs from ordinary physical relations of the body to other bodies in being selective. What we perceive is not something other than reality, but it is less than all reality.

This selective work of perception is continued in the organisation and synthesis of the past which is thought. In the action of one body upon another, action and reaction are immediate. The difference made by the nervous system and by consciousness is a difference in the indeterminateness of the response to external stimulus, and the more our past experience enters into our present, the freer and more indeterminate our action. Thought thus implies the distinction between possible and real action. Thought looks forward to its manifestation in action, but it is built up on past perception and a synthesis of our past memories. It is built up on a contact with reality, but looks forward to a contact with a changed reality. The possibility of error is explained by the discrepancy between these two contacts with the real. This is clear enough in the case of what are called false perceptions. We perceive habitually only a small part of things, we notice or attend to only a part of what is in our field of vision. Our perception, just because it is selective, is discontinuous. Further, we see and feel and hear in discontinuous acts of perception the same objects, and we have to learn to co-ordinate the data of our various senses and the discontinuous perceptions of any one sense. This co-ordination

depends upon experience. From what we already see, we continually anticipate what we shall see on a change of position or what we shall feel if we put our hand on the object. In our ordinary perception it is almost impossible to distinguish what we actually see and what our past experience preserved in memory and in motor habit leads us to expect. Hence in circumstances where the usual connections of perceptions do not hold, we expect or anticipate wrongly, but we seem to be perceiving wrongly. While, strictly speaking, a false perception is really a false anticipation, to refuse to call it false perception is to ignore the extraordinary difficulty of saying what in any perception we do actually see. This is well exemplified in the case of reading which Bergson examines in *Matter and Memory*.[1] It is a common experience, especially with rapid readers, to see words on a page which they afterwards find not to be there. The explanation is that in reading we do not notice more than a small portion of the printed letters. The rest is filled up by memory-images. Yet actual perception and memory-image are so confused together that it is only when our attention is arrested by mistakes of this kind that we realise what has been happening.

[1] P. 125.

If we turn to more developed thinking we find there that a great deal of our judging is based on insufficient data. From what we perceive and from our knowledge of past experience we anticipate what will happen in other circumstances. We entirely mistake the nature of our thought if we think of it as apprehending a reality which is all given in any one perception, as though we were classifying the books on a shelf or apprehending the relations of a mathematical figure. We are continually anticipating from present experience future or possible experience, arguing from our knowledge of the past. If we say that a statement is verifiable, we mean that it involves an anticipation of what will happen or what will be perceived under certain circumstances. Yet the statement may only have been an interpretation of certain data, which suggested but did not necessitate the anticipated conclusion. Our ordinary judgments are not infallible, because we have seldom before us more than a few of the data which would really necessitate them.

Here, again, we may try to distinguish between what we really apprehend and the guess or hypothesis which we build upon our apprehension. We may argue that all real thinking is true, and that it is only because we must act that we make conclu-

sions which are not justified. It is true that in many cases we act on hypotheses which we know to be such, but we habitually neglect to make a distinction. Because our thought is turned toward action, we cannot rest in indeterminateness, in noting that the data are sufficient to warrant some conclusion but not the conclusion which is of practical interest to us, and this has so affected our ordinary thinking that in most cases it is quite impossible to distinguish what we really know and what we only opine. If we say that when we are really thinking we are apprehending reality, and are not making mistakes, we have to admit that we cannot always determine when we are in this condition, and that in any case, far the greater part of what is ordinarily called thinking, and most of science, does not fall under this category. We noticed that in developed thinking the use of language enables us to use action for the development of thought, and we can thus distinguish certain speculative branches of inquiry which in themselves are not affected by practical interests and are therefore not so much at the mercy of practical needs. It is obvious that there are certain inquiries—as, for example, pure mathematics —where we reach a certainty far above any we can have in our empirical judgments. Bergson's

criticism of mathematics applies not to pure mathematics, but to its application to the objects of experience. We know, for example, that the three angles of a triangle are equal to two right angles, but we can never *know* whether any individual figure drawn on the board is a triangle or not. Here, then, we seem to be in a sphere where we can separate the purely theoretical inquiry from its practical application, and it might seem that there error cannot be introduced by the necessities of action.

It is extremely difficult to explain how we can make mistakes in mathematics, though we quite certainly do. But while in mathematics we can and must abstract from any reference to action or to what is useful, we cannot conduct our thinking without action, without the expression of our thoughts in signs and symbols, and these symbolic actions may take the place of real thinking without our being aware of the substitution. There is more ground in mathematics than elsewhere for saying that we make mistakes because we are not thinking, but it is almost as impossible there as elsewhere to distinguish when we are thinking and when we are not. If we could so distinguish, we should not make mistakes.

The difference between a speculative inquiry like mathematics and empirical thinking, is that in the former we are trying only to think, in the latter we should make no progress at all if we did not go beyond what our premisses strictly necessitate.

Thus far we have been considering how the immediate necessities of action are at the root of error—a view rather suggested by Bergson than explicitly worked out by him. Such errors themselves are not conducive to action, they obviously impede it, and in the interests of action must be overcome. But in most of what Bergson says about the misleading influence of action upon thought, he is concerned with more general errors which are not contrary to the interests of our action or at least of our habitual actions. One of them at least he considers conducive to them. We have seen that because perception and attention are selective they are discontinuous. These general errors are the result of taking the discontinuity which is essential to action as the characteristic of reality. In the first place, as we have seen, our perceptions are already selective and because they are discontinuous to our needs we have to synthesise and co-ordinate the data thus given. In our thinking, then, we seem to

start with the discontinuous and connect together the separate data given in perception into a whole. But in this co-ordination we are not trying to synthesise all reality. Our various syntheses have their particular purposes. Hence we easily neglect the continuous whole with which we started. We take the discontinuous contents of perception as ultimate irreducible data, not realising that they are thus discontinuous because of a work of selection and analysis already carried on in perception. This leads directly to the associationist account of knowledge, as presented in English empiricism, which makes the content of single perceptions the ultimate data of thought. It is a fundamental assumption in Berkeley and Hume that the distinctions of sensations are distinctions in reality. Hence the philosophical error which Bergson is most concerned to refute arises from giving a theoretical importance to practical distinctions.

This error is not confined to psychology and English empiricism. If we forget that in all perception we are selecting from a continuum, we may take the distinctive contents of thought as the elements not only of mental life but of reality, and regard reality as an aggregate or collection of parts. But the division of reality into things

and objects is an artificial distinction made for our convenience. Once we begin to ask on what principles we determine what is *one* thing, we find that we are in the sphere of the practical and convenient.

That the views here criticised are erroneous every one will admit, but it may be objected that their refutation is not of much philosophical importance at the present time. Associationist psychology has long been discarded, and no philosopher ever attached great weight to the classification of things which ordinary practice dictates. But it must have become clear by this time that the purpose of much of Bergson's work is to show that the erroneous assumptions which are the basis of associationist psychology are much more far-reaching and subtle than is ordinarily supposed.

If no one would accept without question the practical everyday classification of things, many philosophers have assumed that reality is an aggregate of things of some kind. Whether Kant really thought that reality is such an aggregate is a question of interpretation, but certainly his continual emphasis of the synthetic work of thought, his failure to insist on the previous

analysis which such synthesis implies, has led many philosophers who follow him to regard reality as a sum—to imagine that the process of thought in which we begin with parts and synthesise them into a whole is the process of reality. Much of modern science has been built up on a similar hypothesis. There has been considerable discussion as to the nature of the ultimate elements of reality, whether they are atoms or molecules or units of electricity, but very little doubt that reality does consist of some such elements. It is only of recent years that physics has come to substitute for the atomistic view of reality a view which begins by assuming that reality is continuous, and that the continuous does not admit of construction.

But it may be further objected that it is as difficult to regard reality as a continuum as an aggregate. Practical interests may attach too much importance to distinctions, and may lead to wrong distinctions, but some kind of heterogeneity is surely essential to reality. A homogeneous continuum is, as we have seen, indistinguishable from nothing. This brings us to the most important point in Bergson's argument. He is far from denying that reality is heterogeneous, that there are distinctions and articulations in it, but he argues that such dis-

tinctions are not clear cut, and that "all division of matter into independent bodies with absolutely determined outlines is an artificial division."[1] We can and do make clear distinctions between what is and what is not of importance for our action. We have to admit that in reality everything in the universe is related to everything else, but we know that for practical purposes many of these relations may be ignored. We have seen that counting implies that the things which we count can be regarded as identical *for the purposes of our sum.* In all application of mathematics to existing things, we have lines for the purposes of our calculations taken as straight, surfaces taken as planes. If we fail to realise that this ignoring of fine distinctions and of the individuality and uniqueness of all distance is dictated by practical considerations, we come to regard reality as being really mathematical, as manifesting the sharp distinctions which we make for the purposes of action.

The theories, which emphasise the influence that considerations of convenience have upon thinking, frequently meet with the answer that thinking would not be convenient if it did not follow reality. This answer has only a limited application. For in

[1] *Matter and Memory*, p. 259.

action, and therefore in preparation for action, it may be convenient to ignore some of the articulations of reality, to concern ourselves with its relation to us, and with the manner in which we can act upon it, instead of studying its real articulation. We are primarily concerned with our specific needs and purposes, and we tend to regard reality as so much stuff to be cut up in their service, or as matter upon which we are to impress form. It is true, of course, that we cannot entirely ignore the differences in reality, but we attend to them as they suit our various purposes. Hence we get the notion of a reality which we can divide according to any principle we please, and hence the conception of abstract space. For although all counting implies the recognition of real differences in reality, yet just because we can notice or ignore some differences for some purposes and some for others, we can consider the general laws of counting and measuring in abstraction from the particular nature of the elements counted or measured, and deal only with the divisible as such. We may even hold that just because the differences we count are selected for their relation to our particular purposes, we ought, when we are trying to view reality as it is, and to transcend the misleading influence of action, to

ignore differences altogether, instead of observing the differences which are vital to the object. Then we come to think that in regarding the existing world as a sort of geometrical framework, or a mathematical system of points, we are regarding it as it really is, whereas we are regarding it in the way which is most generally practical.

As the exigencies of action lead us to ignore the real articulation of things, so do they lead us to misrepresent the nature of change and movement. For because in our action upon a moving body we are concerned with where it will be when we act, we attend to the positions through which moving bodies pass, rather than to the movements themselves. We are concerned with what will be the state of things when we act, and we think of change as a series of such states, as we think of movement as a series of points. Change is not uniform, and movements are not all homogeneous, but we are conscious primarily of the discontinuity of our own duration and concern ourselves with the relation of other changes to that. Hence we treat as instantaneous, motions which are so rapid that for our purposes their time may be ignored, or when we come to see that what we took to be simple qualities perceived instantaneously really imply enormously rapid motion,

we think of the real universe as one in which quantitative differences are unreal, and all movement is homogeneous. Hence the conception of homogeneous time, like that of homogeneous space, is the creation of practical needs.

Such are the general errors into which thought is led by its preoccupation with practice. Bergson does not consider them incapable of correction. For, as we have already pointed out, it is a mistake to regard the needs of action as fixed and final. Knowledge serves our purposes, but in its turn enlarges them. As the scope of our purposes widens, they are concerned not with an almost instantaneous present, but with a period of time in which we can follow real change without; we find a relevancy in more and more of the details of reality until we can conceive the general purpose of disinterested knowledge, of knowing reality not as it is related to the discontinuity of our ordinary purposes but as it is in itself. This disinterested purpose implies philosophy whose task Bergson thus describes:—

"Our knowledge of things is not relative to the fundamental structure of our mind, but only to its superficial and acquired habits, to the contingent form which it derives from our bodily

functions and from our lower needs. The relativity of knowledge may not, then, be definitive. By unmaking that which these needs have made, we may restore to intuition its original purity and so recover contact with the real. This method presents, in its application, difficulties which are considerable and ever recurrent, because it demands for the solution of each new problem an entirely new effort. To give up certain habits of thinking and even of perceiving, is far from easy; yet this is but the negative part of the work to be done; and when it is done, when we have placed ourselves at what we have called the *turn* of experience, when we have profited by the faint light which, illuminating the passage from the *immediate* to the *useful*, marks the dawn of our human experience, there still remains to be reconstituted, with the infinitely small elements which we thus perceive of the real curve, the curve itself stretching out into the darkness behind them. . . . The final effort of philosophical research is a true work of integration." [1]

The consideration of this philosophical method, its contrast with ordinary intelligence and the view of reality which is presented to it, is best set forth in *Creative Evolution* and the *Introduction to Metaphysic*, which we shall now proceed to examine.

[1] *Matter and Memory*, pp. 241–42.

CHAPTER V

INTELLIGENCE AND INTUITION

We noticed in our introductory chapter that Bergson maintains that theory of knowledge and theory of life are inseparable.[1] This statement might naturally be taken to imply that knowledge could be fully explained by its history, and raises in our minds the objection that knowledge can only be explained by itself. But the discussion at the end of the last chapter may show the possibility of another interpretation. For we have seen there that the relation of knowing to acting is not only the key to the existence of error in our ordinary thinking, of failures in the end which that thinking consciously sets before itself, but also explains how the exigencies of habitual actions cause certain more fundamental errors as to the nature of thought itself. The theory of life, then, may illuminate the theory of knowledge if it shows us more clearly the history of the mutual interaction of thought and

[1] *Creative Evolution*, p. xiii.

action. *Creative Evolution* is largely concerned with this history. If we take a general view of the evolution of life from its lowest to its highest forms, we find life continually winning new triumphs over the obstacles of matter and continually being defeated by the very instruments of its triumph. For life is impossible without habit and without the stability and permanence which habit implies. Yet if habits become too securely established, if they become masters when they ought to be servants, they hinder the power of adaptability to new circumstances which is the essence of life, and progress ceases. Thought is the greatest of the instruments which life has invented. Its development in man has raised man above all other forms of life. It has been potent not only in satisfying the needs of which man was originally conscious, but even more in developing and enlarging those needs themselves. But thought itself may, by its very success in solving some of the problems of life, become set in habits and assume habitual tendencies and interests which hinder it from solving those problems which in its moments of highest insight it can set before itself.

We have noticed how in ordinary action the purposes of conscious life are set over against

the world in which they are to be satisfied; how external reality comes to be regarded as mere matter upon which life is to set its form, as a stable element in which the movement of life may select its temporary starting-points and ends, and how in this manner the influence of the exigencies of ordinary action may disable thought in the fulfilment of its highest interest, the desire to apprehend reality as it is.

This influence, we have seen, extends itself even to speculative thinking. By the use of language we escape from the necessities of immediate action, and turn action to the use and development of thought; but these necessities have already set their mark upon language, so that it is instinct with certain assumptions which are useful in ordinary action, but fatal to its speculative interests, with the result that when we seem to be concerned with purely theoretical inquiries, our thought is still shaped by the influence of practical ends, and is turned by that influence into contradictions and antinomies.

Discovery of error is the first step towards correcting it. As the mind has already freed itself from the close subserviency of immediate practical ends in the advance from ordinary practical thinking

to the organised sciences, its further task is to free itself from the more subtle influences of these ends, and to rise from science to philosophy. It is with the possibility of accomplishing this further task that we are now concerned.

We noticed in the introductory chapter that this movement of thought is dictated by the difficulties of science itself. The general considerations which we were then discussing were suggested by certain problems in psychology and biology. For these seemed to be inquiries where a recognition of individuality was an essential part of the scientific method. The distinction between two methods of thought which the difference between the biological and the mathematical sciences suggests might seem to be dictated by the different natures of their subject-matter. Bergson in *Creative Evolution* begins with some such contrast, comparing the success of science in the inorganic sphere with its failure in the sphere of life. "The human instinct feels at home among inanimate objects, more especially among solids, where our action finds its fulcrum and our industry its tools . . . our intellect triumphs in geometry, wherein is revealed the kinship of logical thought with unorganised matter . . . our thought in its logical

form is incapable of presenting the true nature of life."[1] But we have seen in Chapter III. that the attempt to distinguish sharply between these spheres of reality breaks down. A purely quantitative presentation of the inorganic is impossible, because it is impossible even there to ignore all qualitative differences, and especially because it makes the conception of motion impossible. On the other hand, the contrast of two kinds of intelligibility was found within the sphere of duration itself. However contradictory a mathematical conception of conscious life may be, it is impossible to regard life as lying altogether outside the sphere of mathematical inquiry. We have not, then, to deal with two separate and distinct spheres, each demanding a special method of study. Science is indeed more at home in the sphere of the inorganic, but it can be applied to life. The ideal of intuition is harder to realise in our apprehension of external phenomena, but without such a realisation we can only give an inadequate explanation of them. The difference between intelligence (to use the word which, in *Creative Evolution*, Bergson applies to the strictly scientific method) and intuition is partly a difference of methods accounted for by a difference of

[1] *Creative Evolution*, pp. x., xi.

sphere; intelligence is more adapted to the inorganic, intuition to life; but even more is it accounted for by a difference in purpose—in the kind of explanation sought. Further, just because this contrast of material is not rigid, the two methods themselves are not independent. Bergson's fondness for beginning with sharp contrasts disguises his recognition of this fact, but he does recognise it. Each method uses the other.

If this is the case, the method of philosophy cannot involve a mere turning back on the methods of science, a reaction to feeling or the irrational. Intuition must be more, not less, rational than science. As life progresses not by giving up the methods which have already secured success, but by combining with them some element which they had neglected, so philosophy must not ignore the immense advance which science has made upon ordinary unscientific thinking, but must try to combine with scientific method an element which that advance has neglected. "Reality itself, in the profoundest meaning of the word, is reached by the combined and progressive development of science and philosophy."[1]

We have already seen that intelligence tends to

[1] *Creative Evolution*, p. 210.

distort our apprehension of reality by neglecting the individual, in the contrast between instinct and intelligence. In *Creative Evolution* Bergson presents this defect in a new way. It is part of his exposition of the connection of theory of life with theory of knowledge to show these two faculties as specialised forms of consciousness, each having something that the other lacks, to argue that intelligence has won its great achievements by a development that is one-sided, and to suggest in his account of instinct what it is that intelligence must acquire to become philosophy.

We are not concerned here with the adequacy of Bergson's account of instinct in animals. He follows his usual method of sharp contrast. He is describing two tendencies which exist in all conscious life, and he pictures instinct as it would be if intelligence were entirely absent from it, intelligence as it would be devoid of instinct, while insisting that in reality this sharp division does not exist. For the purposes of our inquiry the moral to be drawn from a consideration of instinct is clear enough. If we examine the behaviour of animals in whom instinct is very highly developed, we find elaborate and organised behaviour in special situations, which would seem, when considered in

isolation, to argue a very high degree of intelligence, combined with an utter incapacity for solving quite simple difficulties, which are at all unfamiliar. A paralysing wasp behaves towards its victim *as though* it were "a learned entomologist and a skilful surgeon in one."[1] But that it will be able to behave towards other insects of a not very dissimilar structure as a learned entomologist and a skilful surgeon is a most mistaken inference to draw. In an unfamiliar situation the wasp is entirely helpless.

The nature of instinct is a puzzle to us, because we take for granted that a power of dealing intelligently with one situation implies a power of dealing with another related to it, provided that the second is not more complicated. The characteristic of intelligence as opposed to instinct is its adaptability, its power of grasping the general element in a situation, and relating it with past situations. This power may be purchased by loss of that perfect mastery over a special situation in which instinct rules. So modern industry, dominated by scientific inventions and methods, encourages general adaptability and kills craftsmanship. Indeed the advantages and defects of machine production as compared to skilled handicraft strikingly bring out the point

[1] *Creative Evolution*, p. 153.

of Bergson's contrast between instinct and intelligence. For in pursuance of his general connection of thought and action, he connects intelligence with the invention and development of tools, the last stage of which is modern machine production. The animal's instruments of action are organic, parts of himself. They are more complex and perfect than any tool, but yet far more limited in their range. Man, using inorganic tools, gains a much greater power by varying his tools and thereby suiting his actions to the most varied circumstances. His action gains in wideness of range what it may lose in fineness of individual touch. As his tools develop they become standardised and made of standardised parts. He is concerned with things, not as individuals, but as displaying identity. They take on for him the likeness of his tools, are measured by fixed standards, and resolved into varying complexes of standardised parts. The contrast between skilled handicraft and machine production shows us that the contrast which Bergson makes between instinct and intelligence finds its place also within human activity. For here too we find on one side a skill which depends on familiar acquaintance with particular objects; the hand of the craftsman is subdued to the matter on which he works.

There is a close connection between his hand and his particular tool, between the violinist's fingers and his bow, which, just because it is something infinitely more subtle that could be expressed in rules, we naturally call sympathy: and just because this skill is specialised, it has a relatively narrow range. On the other hand the machine works by repetition. Its invention requires insight—something that equally with the artist's skill is beyond the reach of rules; but its use is mechanical, and because it works by repetition there is no individuality in its products.

As in action, so in thought, we may mark the contrast between the appreciation of individual differences, too slight and subtle to be reduced to rule, which is based on long familiarity, and the methods of thought which we can reduce to rules and apply to the most varying material in that we neglect the differences of the individual objects and concern ourselves with their common relations—a method displayed most clearly in counting and its development in statistical methods.

It is to this tendency of thought that Bergson gives the name intelligence. For the doctrines which he has been combating regard reality as that which can be counted, as consisting of repe-

titions of identical parts, and ignore the individuality and movement of things which cannot be reduced to rule, or truly regarded as but the manifestation of a law; and they are the natural product of those sciences which are concerned with the application of mathematical methods to reality. Intelligence, according to Bergson, uses words as tools. Its concepts are regarded as fixed and definite, and we can use and manipulate them as though they were tools. Like tools, they were not got without some vivifying insight, but once obtained they are used as symbols or counters of work that has been done. Their application depends on the principle of repetition, the law of causation that the same produces the same. Thus the intellect works with what is given, and seeks not to apprehend the individuality of the real, but to "reconstitute it with given, and consequently with stable, elements."[1] Logic, in that it considers the relations between concepts independently of the individuals to which they apply, is "the complete set of rules that must be followed in using symbols."[2] Its principles go back ultimately to the law of identity. Its methods, whether by deduction or induction, are based upon

[1] *Creative Evolution*, p. 173.
[2] *Ibid.* p. 169.

the same law. "Intuition implies that qualities can be superimposed on each other like magnitudes."[1] Hence the metaphysic which is based on such logic views the world as a thing manufactured, the individual as a mosaic put together of previously existing elements, a time-process as a series of pictures made into one motion, as are the separate snapshots of a cinematograph film.

This account of language and logic has been criticised, and with some justice. For it would seem to reduce intelligence to a bare apprehension of identity which would make all thought impossible, and any intelligent logic must surely be more than that. The attempt to construct a formal logic which should be entirely independent of the matter of thought has long been discarded. Since the logic of identity is as dead as associationist psychology, Bergson seems at first sight to be only flogging a dead horse. On consideration we find that the results of Bergson's criticism are more far-reaching than those of former critics, that unlike previous criticism of the logic of identity he not only rejects its obviously wrong conclusions, but really discovers the root of its errors.

This will become clear if we consider two

[1] *Creative Evolution*, p. 228.

obvious objections which may be made to Bergson's account of intelligence.

Bergson, as we have seen, connects intelligence with space and measuring, and especially with mathematics. The logic and the metaphysic which he attacks are based upon the mathematical sciences. Yet surely, it may be urged, it is a grievous mistake to regard mathematics as the result of a movement of thought which is based only upon the law of identity. Does not mathematics involve imagination and the insight of genius as much as any other form of inquiry? Can it really be said to depend upon repetition, or to be a mere reconstruction of the given? These questions can admit of but one answer.

But we must remember one point in the analogy of intelligence with the using of tools which is of importance here. The use of the machine may be mechanical, but its invention is not. That requires the insight of genius. Similarly, when Bergson says that intelligence uses concepts like tools he does not mean that the concepts themselves are the work of intelligence as he describes it. We noticed in his analysis of counting in *Time and Free Will* that he described each number as in itself the work of an individual intuition. In an article in the

Revue de Metaphysique et de Morale,[1] he describes as a misrepresentation a criticism of his account of geometry in *Creative Evolution* which assumed that he regarded geometrical intelligence as something rigid and incapable of evolution. In the *Introduction to Metaphysic*, he makes his meaning clearer. He is concerned there with the contrast between intelligence and intuition, and asserts that intuition, as he describes it, is nothing new. "A more profound history of human thought would show that we owe to it all that is greatest in the exact sciences as well as all that deserves to live in metaphysic. The greatest of the methods of inquiry at the disposal of the human spirit, infinitesimal analysis, came from this reversal of thought. At the same time" (and here he comes to the important point) "that method has only been able to attain to its wonderful applications through the invention of definite symbols, and if intuition, as we describe it, originated the invention, it was the symbol alone *that made the application possible*. But metaphysic, which *is not concerned with application*, can and must refrain from translating intuition into symbols."[2]

Bergson is criticising not the principles of

[1] January 1908.

[2] *Introduction to Metaphysic*, G. T. p. 43. Italics mine.

mathematics, but *the assumptions underlying the application of mathematics*. He is not denying the reality of mathematical universals, but asserting that they are not the only universals. There is imagination and intuition in pure mathematics, there is none in the use of a table of logarithms or tables of compound interest. Such calculations can be done by a machine. Intuition is wanted to apprehend the principle of the syllogism, but that intuition, when reduced to symbols, can also be worked by a machine.

This distinction between the intuition and its application is so important that it is worth while elaborating it. For neglect of it will be as fatal to the understanding of Bergson as it has often been to the understanding of Kant. The distinction may best be realised in the attitude taken up towards mathematics by Plato and Kant. Plato distinguished sharply between the apprehension of mathematical truth, which he regarded as certain and infallible, and its application to the world of becoming and decay. The first was, the second was not and could not be, knowledge. Always when Plato is talking of knowledge he is thinking of the apprehension of the pure universal, not of the use which may afterwards be made of that

apprehension in the better ordering of the particulars of the world of sense. That, partaking as it does of the nature of the infinite, cannot be the subject of knowledge. Plato is one with Bergson in insisting that true knowledge must dispense with symbols. For both, knowledge is immediate apprehension, an act of the spirit. Bergson differs from Plato in that he holds that the latter took the mathematical universal as the type of all universals, and hence denied the reality of time and of change.

Unlike Plato, Kant is not concerned with the problems of pure mathematics at all. He never admits for a moment that the apprehension of pure mathematical truth constitutes a problem or admits of a deduction. He is concerned with the problems raised by the great development of physics and applied mathematics, as Plato was with those raised by the development of pure mathematics. He never asks how are mathematics true: he is concerned to discover how they are applicable to the world we perceive with our senses, how the truths which the understanding apprehends can be held *a priori* to be valid of the world which is given to perception. Most modern thinkers are similarly concerned with questions raised by the

applied sciences, and unlike Plato they seek the test of truth not in its own apprehension, but in the character of its results when applied, their coherency or systematic nature, or even their usefulness.

It is significant that a modern philosopher like Mr. Bertrand Russell, whose interest is pre-eminently in pure mathematics, holds a doctrine as to the nature of truth very like Plato's, and in his distinction between what is and what exists has revived the Platonic distinction of the world of knowledge and the world of opinion. Bergson shares the modern interest in the subjects treated in the biological sciences. But in his conception of philosophic insight he follows Plato. He is concerned to discover whether, instead of studying the facts of life indirectly by the application to them of mathematical principles, they can be apprehended with the immediacy of philosophy.

With this distinction in our minds we may examine the second objection, which bears more specially on Bergson's account of induction. Professor Bosanquet, in a paper read before the Aristotelian Society, has criticised Bergson's statement that induction rests on the principle of identity, pointing out that such a doctrine reduces judgment to mere tautology, showing that if we examine the process

by which any induction is actually reached in science, we find that it implies a process of active thought and insight which could not be reduced to rule. Further, he argues that what we apprehend in induction is not a simple identity, but a real universal; induction implies insight into the real concrete unity of the individual cases examined.

It is true that Bergson, by insisting that deduction and induction are both built upon a mathematical basis, tends to ignore in them every element but that of quantitative analysis. We have suggested already in Chapter III. that he pays little attention to the part played in empirical science by the observation of likeness and unlikeness, leading us to dwell for ourselves on the side he passes over. The perception of qualitative differences and the estimation of their significance cannot be eliminated from the processes of empirical science. As we have seen, the principle of the law of causation that like produces like does not imply an identity between cause and effect. The relation between cause and effect cannot be deduced merely from an analysis of the cause. It implies a perception of change which could not be reduced to identity. If it be objected that the principle of causation as used in induction is false because in reality a change is

caused by all other preceding changes, and any such isolation as causation implies is therefore misleading, the answer is that to assert that all the past is equally connected with any particular event is to deny real individuality, and to regard reality as a system in which qualitative differences are of no importance. The apprehension of a causal relation, then, implies some appreciation of individuality. It works on a basis of recognising likeness and unlikeness between qualities, but it is not simply a mechanical application of the principle that behind likeness there is identity. Rather it implies a power of distinguishing between relevant and irrelevant likenesses, and of forming a conception of a real union of qualities.

But these arguments are all concerned with the nature of the apprehension of a causal relation, not with what is implicit in its application to other cases. To see that A causes B requires insight and apprehension of individual characteristics. When we say "This is like A, and therefore its effect will be like B," we are applying a result of that insight, and we are concerned with Á only in so far as it resembles A. That implies that Á repeats A, for its difference with A must for our purpose be ignored. Hence, although in the original apprehension of causal relation we may not isolate the cause from

its surroundings more than the individuality of the circumstances demand, in applying our apprehension and turning it into a rule, we effect an artificial isolation. For we are concerned only with what we treat as repetitions of A, and actually if we are dealing with a process of real change repetition is impossible. Further, in science very much of the work of tracing causal relations is a work of analysis. For the changes which at first sight seem to be simple are found to be themselves a complex of simpler changes, and these simpler changes are known by their identity to simpler changes already studied. The whole change is understood as a new complex of old elements. Repetition, then, and quantitative analysis are implied in the working of inductive methods in science, and if Bergson's account seems to neglect other elements, it is because he is concerned with intellect as opposed to intuition, and with the way in which the mathematical implications of the intellect dominate scientific conceptions of causality. Working out, then, of causal relations would be impossible were the causal relations not apprehended by methods other than those which guide their application. This is only to repeat that the using of machines and their invention need very different powers of mind and

principles of thought. Yet intuition and intelligence are not isolated, though they are contrasted tendencies of thought. A process whose main purpose falls under the head of intelligence may involve the use of intuition, and *vice versa*.

The application of intuition which implies repetition also makes possible prediction. Science, unlike philosophy, is concerned with application because from its practical interests it is concerned to predict. The real distinction between intuition and intelligence lies, as we suggested, in their criterion of truth. As the test of mathematical truth lies only in its apprehension, so there can be no verification of intuition. But science, because it is concerned to predict, places the test of the truth of its intuition in experiment, in being able to say "If such and such conditions are arranged, such and such results will follow," implying that the experiment can be repeated. But because in some subjects of inquiry it is less possible to ignore individual differences than in others, the method of experiment and prediction is not always equally adequate. In the sciences which deal with life the inadequacy of the method is most patent, because the individual differences which a study of repetitions ignores are most important. The purpose

of science remains the same. But the method pursued in biological science will depend on the stress which is laid on the necessity for intuition in the apprehension of causal relations or on the element of repetition and identity in the application of such intuition. For it is possible to realise that when we have to deal with individuals which exhibit a common structure but are not identical, the verification of causal relations by experiment may demand intuition equally with their discovery, and that it may require as much real insight to see the common character of the results of the experiments as it did to see the common character of those cases from a study of which the theory to be verified was produced. When this happens, the contrast between intuition and its application is disappearing, science is becoming more like philosophy as Bergson describes it, but its results have not the rigour and clean-cut nature of the exact sciences. On the other hand, if we insist that the ideal of scientific method must be mathematical, we are confined in the study of life to those characteristics which really repeat themselves, and we must ignore the individual differences of cases. Our results will then apply to the mass but not to any one individual. This is seen clearly

enough in the application of statistical methods to the sciences of life. Just because in making their inquiries they ignore the individual, on the individual their results have no bearing. They are concerned with averages and mass results. They approximate to the calculations of chances in gambling, the results of which hold for "the long run" of the game, but have no application to any individual throw. For in such calculation we ignore the causes which determine the result of any single throw, and are concerned simply with the conditions under which all throws take place. Because the determining causes of individual cases cannot be ignored, what is to happen "in the long run" may never take place in actual fact. Similarly, the averages of the biometrician or the sociologist throw no light on the individual; they only state the conditions common to all individuals or the limits within which their activity finds scope, and there is this difference between their results and those of the calculation of chances in gaming that the activity of the individuals which they ignore may alter the conditions with which the statistical methods are concerned. Statistical methods of sociology have their use for practical purposes, when our practice is concerned not with individuals

but with their conditions. Legislation, for example, is concerned to modify the external conditions of life, and therefore necessarily relies upon statistical methods. But to seek to obtain from such methods an apprehension of historical change is to ignore the part played by individuality in history.

The sciences, then, if they are exact and able to predict in so far as they are mathematical, gain their exactness by ignoring individuality. They are adequate in the sphere of spatial relations where individuality can be ignored. In the sphere of life their prediction loses its certainty, and such prediction as is possible is only achieved by the sciences adopting the method of philosophy or by their confining themselves to the production of results which are useful for practical purposes, but have only a narrow application to reality. We must now turn to the contrasted method, and ask whether it is possible to have an insight into the development of life which shall have the immediacy of insight into mathematical truth.

The difficulty of the task lies in the nature of the reality we have to apprehend. The certainty of mathematical insight depends on the self-contained nature of mathematical relations. We can hold together in one synthesis all the relevant data.

How can we similarly synthesise a process which goes beyond the limits of our perception both in space and time? We can never in this sphere attain the certainty of mathematical insight, for our synthesis must always be imperfect. Certainly we can do nothing to any good purpose by giving up that enlargement of the compass and grasp of our perception which we owe to science. To fall back upon feeling is to shut ourselves in the narrowest limits of our own personality. Intuition must supplement and not dispense with science. "Concepts," says Bergson, "are indispensable to it, for all other sciences work with concepts, and metaphysic cannot do without the other sciences."[1] How, then, does it differ from science?

It differs first of all, as we have seen, in its purpose. It attempts to apprehend reality, not in the light or as it may serve the particular purposes of action, but as it is in itself. For this reason it must be, like art, disinterested, or rather, like art, interested only in its object. And intuition implies sympathy, in the sense at least of caring enough about things to know them in their own nature.

But Bergson seems to say that intuition implies

[1] *Introduction to Metaphysic*, G. T. p. 13.

sympathy in a further sense, the sympathy that enables us to assume the nature of other things and feel with them. We have already noticed in an examination of our knowledge of motion the misleading suggestions of such language, as seeming sometimes to imply that thought and accurate knowledge is an impediment to philosophy. But we shall understand Bergson's meaning better if we recall the analogy of instinct. He is thinking of that close acquaintance with an object which is gained only by long experience with it, an acquaintance constructed out of a synthesis of innumerable details and subtle discriminations. "It is impossible to have an intuition of reality, that is an intellectual sympathy with its innermost nature, unless its confidence has been won by a long comradeship with its external manifestations."[1] The quotation is in some degree metaphorical. A passage preceding it makes his point clearer, and is worth quoting at some length: "This faculty is in no way mysterious. Every one of us has had opportunities to exercise it in some degree. Any one, for example, who has been engaged in literary production, knows perfectly well that after long study has been given to the subject, when all docu-

[1] *Introduction to Metaphysic*, G. T. p. 57.

ments have been collected and all sketches made, one thing more is necessary—an effort, often painful, to set oneself in the heart of the subject and get from it an impulse as profound as possible, when there is nothing more to be done than to follow it. This impulse, once received, sets the spirit on a path where it finds again all the information it had collected and a thousand other details. The impulse develops itself, analyses itself in expressions, whose enumeration might be infinite; the further you go on, the more is revealed; never can you say everything that is to be said; and yet if you turn back to apprehend the impulse you feel behind you, it is hidden from you. For it was nothing but a direction of movement, and although capable of infinite development, it is simplicity itself. Metaphysical intuition seems to be of the same kind. Here the counterpart of the sketches and documents of literary production is the totality of the observations and experiences collected by the positive sciences."[1]

There is from the nature of the case vagueness in a description of this kind. But, as we have seen, all empirical inquiry implies some such power of gathering from observation of many details an

[1] *Introduction to Metaphysics*, G. T. p. 56.

insight into the reality which they manifest. It is a process which cannot be reduced to rules, for it is always in itself a creative act. Two suggestions may be offered to show that the process, if vaguely described, does not therefore imply vague and nebulous thinking. The first is a reference to the well-known passage in Plato's Seventh Epistle, where Plato says of his own metaphysic: "It cannot be put into words as can other inquiries, but after long intercourse with the thing itself and after it has been lived with, suddenly, as when the fire leaps up and the light kindles, it is found in the soul and feeds itself there." And after describing, much in the manner of Bergson, the inadequacy of language and of our instruments of inquiry, both conceptual and perceptual, says that the only way of overcoming this inadequacy is not to give up what instruments we have: rather, after long rubbing together of perceptions and definitions, the apprehension of the real will suddenly flame forth.[1]

The second suggestion is a reference to the example of history. Bergson unfortunately has paid no attention to the nature of historical inquiry, but it admirably illustrates his account of intuition. For history implies scientific method

[1] Plato, *Epistles*, vii. 341, 344.

and careful and accurate collocation of particular facts. But it is itself more than a science. If it attempts to regard its facts as the mere outcome of laws, or the inevitable unrolling of a plan known from the beginning, it does injustice to the individuality of its subjects, and distorts its facts. History never repeats itself. But it is not a mere collocation of facts, for it is a synthesis of them—a synthesis for which there are no rules; its success depends on the individual insight of the historian, and on his intimate and long acquaintance with the facts to be synthesised. History (and in this respect philosophy is like it) is both science and art. It follows science in the wideness and comprehension of its scope and mastery of detail; it is like art in that it is the work of genius.

The analogy of history will also help us to consider how we may know whether or not an intuition is true. Neither history nor philosophy admit of verification in the ordinary sense of the word, for verification implies repetition. The test of a great history is the extent to which it enables us to understand and have insight into the past; for the facts of history, although they could not have been predicted, are intelligible if we look back upon them rightly. The test of a great history

is not only that it is correct in its details and facts, though that is essential, but that it makes us understand them. Philosophic intuitions must be faithful to the facts of science ; whether they are so or not only science can tell us. It must also make us understand these facts, and there is no fact which will tell us that that is accomplished save the process itself.

A further illustration of the nature of Bergson's conception of philosophical method may be found in his own method of exposition. We have already seen that that involves analysis. Indeed, its difficulty lies in its abstractness. Bergson separates tendencies which in reality are never separate, duration and extensity, quality and quantity, time and space, instinct and intelligence, and develops their separate implications. Neither side of these contrasts could exist separately, nor do they merely lie side by side in reality. But reality can only be understood if we first analyse separately the tendencies we can distinguish in it, and then by an act of synthesis see the whole afresh. Because that act is an intuition, we can be helped towards making it by concrete pictures, in which we see as one what the previous analysis has divided. Hence the importance and value of Bergson's wonderful illustrations. They

help us to see in one act of thought the reality he is describing. Both sides of the method are indispensable. Were there no analysis the pictures would become mere misleading metaphors, for our thought would rest in the picture and take that for the reality. Were there no pictures, it would rest in the analysis and lose itself in abstractions. Only "by rubbing the two together" can the flame of intuition burst forth.

If this, then, be the method of philosophy, what is the nature of reality as revealed by it? Obviously that cannot be described adequately, but can only be apprehended in the process. But we may note how the double need for intuition and analysis in apprehending corresponds to the double aspect of the reality apprehended. For the exact sciences, as well as the intuitive sciences, are in touch with an aspect of reality. Bergson treats of both these aspects, but as we noticed in Chapter III., unlike the metaphysical doctrines he criticises, which begin with the stable and permanent, and endeavour to describe movement and change in terms of them, he begins with the reality of movement and seeks to see the place of the permanent in that movement. The first principle of his metaphysics, then, is an asser-

tion that there are real movements. As the reality of movement or change implies time, and as time implies individuality, these real movements are individual. For, as we have seen, it is the discontinuity of our needs and purposes that makes us reduce movement to a series of states or points, and if we are to rise above such practical implications of thought we must recognise that our duration does not stand over against a timeless world, but is one among other durations, and see that we should understand other movements if we could apprehend them as we can apprehend the process of our own consciousness. There is not, then, one duration, but many durations. Yet while these durations are, because individual, discontinuous with the rest of reality and with each other, they are not entirely discontinuous or entirely separate. Individuals out of all relation to an environment are as impossible as a homogeneous whole in which there is no individuality. While a real individual is a relatively closed system, no individual is clearly and sharply cut off from the rest of the world. We saw in the examination of biological methods that the facts seem equally inconsistent with the mechanical theory of life, with the view that evolution is the working out of a single plan in which the individuals did not count,

and with the view that it was the result of the combined efforts of separate individuals. Rather they suggested that a species, for example, was in some sort an individual in itself. It is as hard to make absolute divisions between the various forms of life as between the different members of a species, and we must regard all life as in some sense one, as having some kind of common impulsion. But the nature and degree of this unity, whether in life in general or in space, cannot be settled in any *a priori* way, but only by empirical investigation. For individuality admits of degrees, and as there are different "rhythms of duration," so individual systems are more or less closed, more or less discontinuous with the rest of reality.

The fact that individuality has degrees may serve as a key to the relations of the two aspects of reality with which the exact sciences and philosophy are severally concerned; for we saw in the third chapter that the contrast between the two forms of intelligibility which correspond to science and philosophy is found within conscious experience itself, and the application of the exact sciences to life, limited though it is, shows that the distinction between the spheres of intelligence and intuition is a distinction of degree. If we start with an exami-

nation of conscious experience, we find that its movement and synthesis is only possible on a basis of permanence. Synthesis of memories into new thought is possible, because as past acts of thought and perception they have the fixity which belongs to the past. There could be no life if the acts of life did not form themselves into stable habits which are capable of repetition. To recognise identity only in our motor reactions is not to explain away its reality. But we are then setting it within conscious life only. And if we are to view in the light of spirit reality without us, we cannot deny to it this one of the essential elements in spirit.

In the process of "duration," then, we can distinguish two aspects, the living synthesis of the act of thought, and over against it and making it possible identities of habit and motor reaction. As our thought becomes less active, less a synthesis of all its past experience, it becomes more a series of associated ideas which, just because they are not synthesised with the rest of our experience, repeat themselves. In so far as conscious life is such a series of associated ideas—that is, in so far as we are not really thinking—it is not free, and can be scientifically studied. Yet these ideas and memories are the basis of thinking, and each of our acts of thought

becomes in its turn a memory, and the basis for further acts. The creative movement of life implies the same two aspects. Its creations have a basis of habit, and in their turn become habits. Its movement is a process of synthesis to new forms, but it is accompanied and made possible by another movement towards fixity and repetition and sameness. The artist's fingers may be painting a picture which, because it is a creation, could not have been predicted, and was not contained in the past: but all the time they are dispensing energy which has been stored up in a special form in his muscles, and in his brain cells. This downward movement can be calculated just because it is a movement from mobility to fixity. It can be regarded as necessary, because there is no more of it in the end than in the beginning. Its limit is a homogeneous medium where qualitative differences have disappeared.

If in reality without us there is real movement and change, we cannot predict or reduce to mechanical terms its growth or its production of novelty; but we can calculate the other side of the movement, the reduction of its density, the dissipation of its energy, and the elimination of its qualitative differences. Because the exact sciences are concerned with this aspect of reality, following the direction of

the movement they study, they set up the idea of a universal mathematic where qualitative differences are eliminated, and construct a metaphysic from their ideal, forgetting that while it is possible to discriminate in a movement a series of points through which it passes, it is not possible from a series of points to construct a movement.

Bergson, like Kant, asserts the validity of mathematics by the delimitation of its sphere. Kant, however, because he was concerned wholly with the mathematical sciences, held that what was outside of the sphere of mathematical application was outside of the sphere of knowledge. Hence what was shut out from the operation of the understanding was given over to faith, but a faith divorced from any kind of knowledge could not hold its own. The importance of Bergson's limitation of the sphere of mathematical inquiry is that it makes room for another method of inquiry, which equally with mathematics is concerned with reality, which follows its real articulations and individuality, and which, taking up as it does the results of the exact sciences, enables us to solve those antinomies and contradictions engendered by a one-sided preoccupation with the mathematical sciences.

Printed by Ballantyne, Hanson & Co
Edinburgh & London